# SELF-ASSESSMENT REPORT ON THE QUALITY OF EDUCATION IN THE DOCTORAL SCHOOL

Szkoła Doktorska

Politechnika Bydgoska im. Jana i Jędrzeja Śniadeckich

Evaluation period: 01-10-2019 to 10-09-2025
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# PART A

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## Doctoral School Address

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04

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-

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# VISITING CARD

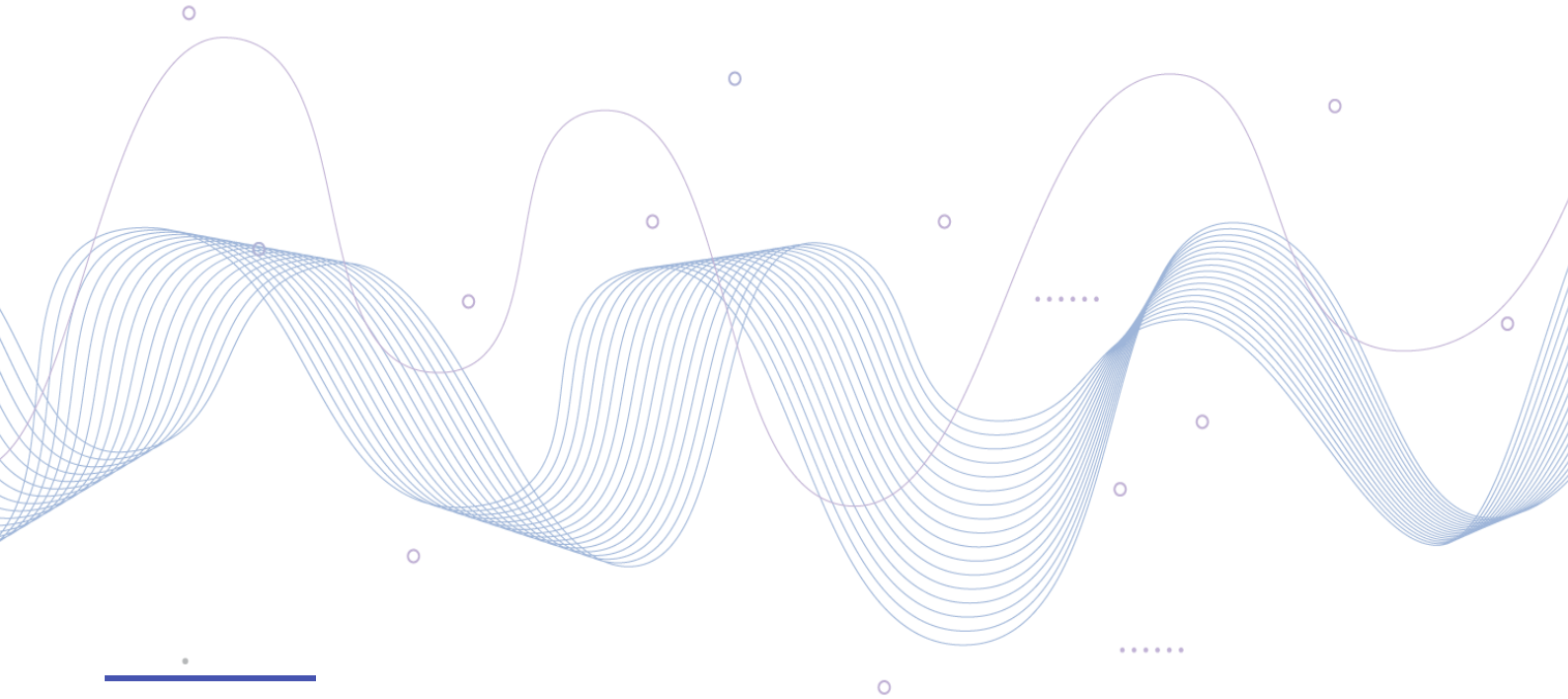
## Basic Information about the Doctoral School

### Year of Creation

2019

### Institution running the doctoral school

Politechnika Bydgoska im. Jana i Jędrzeja Śniadeckich



| Field of Education | Education Disciplines |
|---|---|
| Social sciences | management and quality studies |
| Engineering and technology | information and communication technology<br>chemical engineering<br>mechanical engineering<br>civil engineering, geodesy and transport |
| Natural sciences | chemical sciences |
| Agricultural sciences | agriculture and horticulture<br>animal science and fisheries |

| Name/Scope of the Education Program (PL) | Name/Scope of the Education Program (EN) |
|---|---|
| Szkoła Doktorska UTP | UTP Doctoral School |
| Szkoła Doktorska UTP - I korekta | UTP Doctoral School – revision I |
| Szkoła Doktorska PBŚ - program nr II | PBŚ Doctoral School – program No. II |
| Szkoła Doktorska UTP - II korekta - związana ze zmianą nazw dyscyplin | UTP Doctoral School – revision II – the change of discipline names |
| Szkoła Doktorska PBŚ - program nr II - korekta I - związana ze zmianą nazwy dyscyplin | PBŚ Doctoral School – program no. II – revision I – the change of discipline names |
| Szkoła Doktorska PBŚ - program nr II - korekta II - dziewięć dyscyplin | PBŚ Doctoral School – program no. II – revision II – nine disciplines |
| Program nr I - III korekta - wygaszenie AEEiTK | UTP Doctoral School – revision III – termination of AEEiTK |
| Program nr II - korekta III - osiem dyscyplin | PBŚ Doctoral School – program no. II – revision III – eight disciplines |

### Characteristics of the Doctoral School

**The mission of the Doctoral School** of the Bydgoszcz University of Science and Technology named after Jan and Jędrzej Śniadecki (SzD) is the effective and interdisciplinary education of new academic staff who, by carrying out research projects of high practical value, will contribute to the development of the university and to increasing the innovativeness and competitiveness of the economic environment.

The Doctoral School was established by Ordinance No. Z.1.2019.2020 of the Rector of the University of Science and Technology and Life Sciences named after Jan and Jędrzej Śniadecki in Bydgoszcz of 18 September 2019 and has operated since then. The university has one doctoral school. The SzD was created based on the university's long experience in doctoral studies: at the Faculty of Agriculture and Biotechnology since 1996, at the Faculty of Mechanical Engineering since 2003, at the Faculty of Animal Breeding and Biology since 2004, and at the Faculty of Civil and Environmental Engineering and Architecture since 2011. At that time, education was conducted in the form of third-cycle studies in the disciplines: agronomy, environmental protection and management, animal science, construction and operation of machines, and civil engineering.

The School is managed by a director and deputy director. The SzD management reports directly to the Rector. Within the SzD operates the SzD Council as the director's advisory and consultative body. The Council consists of representatives of all disciplines in which education is conducted or planned. A discipline in the Council is represented by the chair of its scientific council and another member appointed by that council, holding at least the habilitation degree and, if possible, involved in the education of doctoral students or serving as a dissertation supervisor. Administrative services are provided by the SzD Office (Mon–Fri) and online via MS Teams. Outside office hours, doctoral students may submit documents through the Campus Box. Services are provided in Polish and English.

**The Doctoral School has a multi-field and interdisciplinary character**. At present, the SzD offers education in four fields of science: "engineering and technology," "agricultural sciences," "social sciences," "natural sciences," and in eight disciplines: "computer science and telecommunications," "chemical engineering," "civil engineering, geodesy and transport," "mechanical engineering," "chemical sciences," "management and quality sciences," "agriculture and horticulture," and "animal science and fisheries." This required the preparation of an appropriate curriculum. On the one hand, common courses give doctoral students general preparation for research activities. On the other, some methodological courses are tailored to two groups of disciplines, conventionally called "natural sciences" and "technical sciences." In addition, the program includes electives specific to each discipline. The SzD provides education in Polish and, for foreign doctoral students, also in English.

The first admission in 2019/2020, comprising 16 candidates, was directed to those funded from the subsidy. The next two admissions in 2020/2021 and 2021/2022 included candidates funded both from the subsidy and from external funds obtained through competitive grants. In these admissions 23 and 28 persons were recruited, respectively. After several years of experience, it was found that doctoral students designated as project performers or recruited for the implementation of externally funded projects performed IPB tasks on time and at a high level. Therefore, since 2022/2023 recruitment has been conducted exclusively for candidates with scholarships from external funds obtained through competitive grants. Candidates may also be recruited during the academic year if this is provided for in the schedule of grant applications. In subsequent admissions 3 (2022/2023), 2 (2023/2024), 2 (2024/2025) and 3 (2025/2026) persons were recruited. In total, 23 candidates funded from external sources have been admitted, including 15 from the Ministry of Science and Higher Education under the "Implementation Doctorate" program, 4 from the National Science Centre in the OPUS competition, 2 in the Polonez Bis 2 competition co-financed by EU funds
and 2 funded by the European Commission under Horizon 2020. Since 2020/2021 the SzD has offered education in English for foreign doctoral students. In total, 74 persons have been recruited, including 27 women and 47 men, 13 foreigners and 61 Polish citizens.

For doctoral students working on their dissertations as part of projects financed from external funds, SzD has introduced solutions dedicated to them. In addition to continuous recruitment, doctoral students involved in research projects may apply for an Individual Study Program, allowing them to establish a personalized curriculum and to be exempted from some classes.

The SzD ensures high standards of education and effective implementation of IPB so that its graduates meet all statutory requirements for the award of the doctoral degree. It also cares for the well-being of doctoral students, supporting them in education, research, contacts with supervisors and academic staff. Through its website, the information channel in MS Teams and the SzD Office, it provides current and useful information. It actively supports doctoral students in administrative matters, including foreigners applying for or extending residence permits in Poland.

The SzD management recognizes the need for continuous improvement and develops its competences through training, conferences and consultations with academic law specialists. This knowledge leads to regular revisions of the regulations (4 versions with amendments), the curriculum (2 versions with amendments) and recruitment rules (4 versions).

In summary, the SzD is characterized by:
a) interdisciplinarity – education in four fields and eight disciplines,
b) continuous improvement – regular updates of regulations and curriculum,
c) flexibility – continuous recruitment and the Individual Study Program for externally funded doctoral students,
d) good administrative support – services provided on-site and online, in Polish and English.

## Additional Information about the Doctoral School

### Educating Staff

Numerical data for the evaluation period

| Educating Staff | Instructors | Supervisors | Assistant Supervisors |
|---|---|---|---|
| Number of people | 43 | 52 | 36 |

### Doctoral Students

**Number of doctoral students (total):** 74

| Recruitment during the evaluation period | 2019/ 2020 | 2020/ 2021 | 2021/ 2022 | 2022/ 2023 | 2023/ 2024 | 2024/ 2025 | Total |
|---|---|---|---|---|---|---|---|
| Number of recruited doctoral students | 16 | 23 | 28 | 3 | 2 | 2 | 74 |
| Number of doctoral students who completed the doctoral school | 5 | 9 | 3 | 1 | 0 | 0 | 18 |
| Number of doctoral students removed from the doctoral student list | 11 | 11 | 8 | 2 | 0 | 0 | 32 |

| Mid-term evaluation results | Positive | Negative |
|---|---|---|
| Number of Doctoral Students | 50 | 3 |

| Educational Programs | Number of Doctoral Students |
|---|---|
| UTP Doctoral School | 0 |
| UTP Doctoral School – revision I | 0 |
| PBŚ Doctoral School – program No. II | 0 |
| UTP Doctoral School – revision II – the change of discipline names | 0 |
| PBŚ Doctoral School – program no. II – revision I – the change of discipline names | 0 |
| PBŚ Doctoral School – program no. II – revision II – nine disciplines | 0 |
| UTP Doctoral School – revision III – termination of AEEiTK | 22 |
| PBŚ Doctoral School – program no. II – revision III – eight disciplines | 5 |

**Additional Numerical Data on Doctoral Students**

| | |
|---|---|
| Number of foreign doctoral students | 13 |
| Number of doctoral students with disabilities | 3 |
| Number of doctoral students in the Implementation Doctorate program | 12 |
| Number of doctoral students in the EU program | 4 |
| Number of doctoral students employed by the institution running the doctoral school as academic teachers or research staff | 6 |

### Graduates

Numerical data for the evaluation period

| | |
|---|---|
| Number of graduates who applied for initiation of proceedings for the award of a doctoral degree | 18 |
| Number of doctoral students who completed the doctoral school | 15 |

# INFORMATION ON THE ENTITY'S COOPERATION WITH THE DOCTORAL STUDENTS' COUNCIL

Cooperation between SzD and the doctoral students' self-government is comprehensive. It primarily includes the active participation of URSD in SzD Council meetings, which ensures current knowledge and real influence on legal and organizational matters. URSD also participates in recruitment committees, ensuring transparency of the admission process and supporting the integration of new doctoral students, especially foreigners.

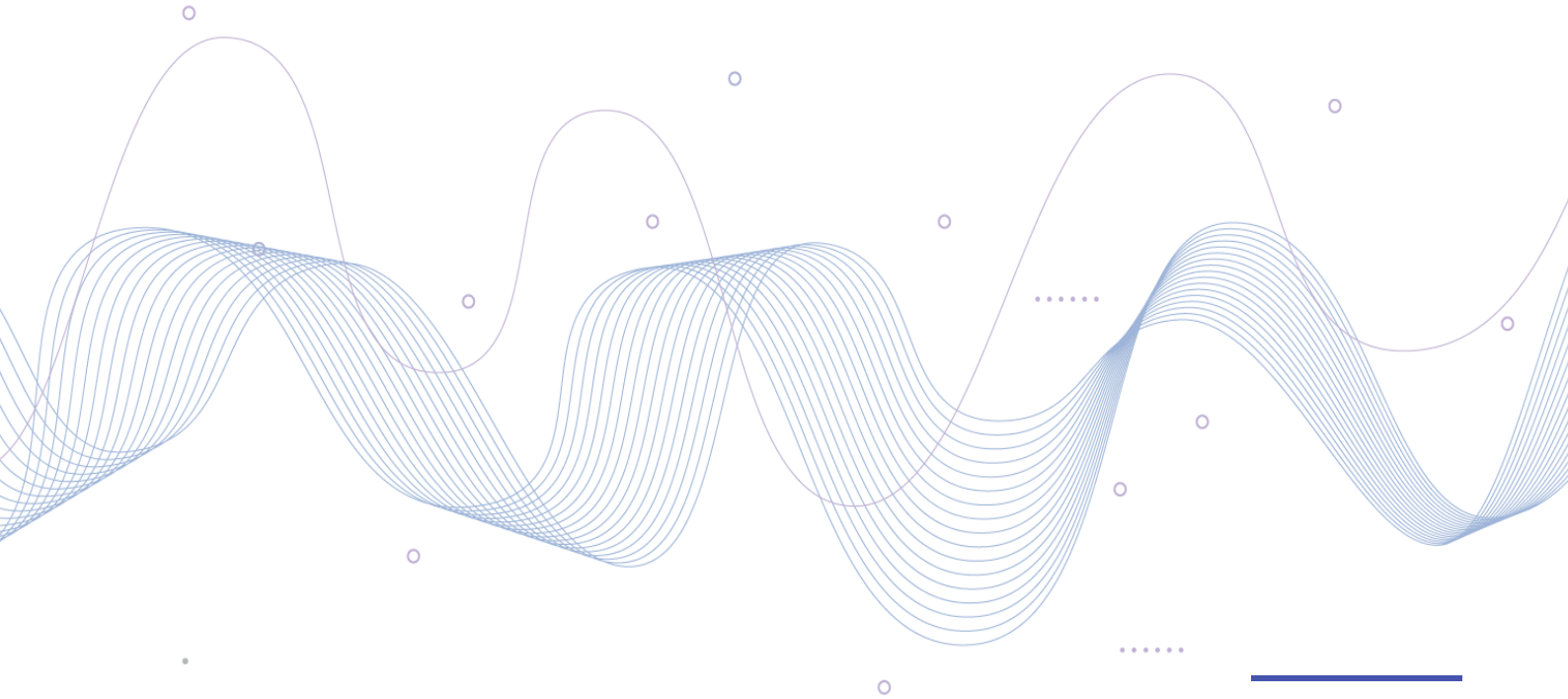
An important area of cooperation is consultation with URSD on issues defined in PSWiN (study program, regulations, appointment of the director and deputy) as well as non-statutory matters, such as recruitment rules. Doctoral students do not limit themselves to expressing opinions – they actively propose changes to documents, both within the Council and in contacts with the management. This cooperation has continued since the establishment of SzD.

URSD also contributes to improving education and research. An example is the document *"Good practices in supervisor–doctoral student relations"*, prepared with the management as part of task *IA14. Development of an advisory program for establishing collaboration between early-stage researchers and their mentors/supervisors* under the HR Logo application.

Cooperation includes supporting the management in improving the quality of education by motivating doctoral students to participate in surveys and through activity in the University Committee for Quality and Eval. of Education. The self-government exercises electoral rights and represents doctoral students in university, including the Senate, disciplinary committees and the the HR Excellence in Research.

Thanks to this cooperation, the self-government not only represents doctoral students but also co-creates the development policy of SzD. The presence of doctoral students in key bodies fosters partnership in the academic community, strengthens the sense of belonging and increases the influence of young researchers on the conditions of research and education.

# INFORMATION ON THE DOCTORAL SCHOOL GROUPED BY 8 EVALUATION CRITERIA



## 1. Adequacy of the education program and individual research plans to the learning outcomes for qualifications at PRK level 8 and their implementation

**Courses in the program** can be divided into several blocks with different functions:
1) methodological: Methodology and Research Planning, Data Analysis, Numerical Methods, Preparation of Scientific Articles and Presentations;
2) general and interdisciplinary: Contemporary Trends in the Development of Science, Philosophy of Knowledge, Ethics in Science, Rhetoric, General elective courses;
3) practical: Academic Entrepreneurship, Professional Practice, Grant Essentials, English in Science;
4) specific to individual disciplines: included in the "Block of elective subjects from a given discipline".
Due to disciplinary specificity, some courses are taught separately for two groups of disciplines, conventionally called "technical" and "natural". This applies to "Methodology and Research Planning", "English in Science", "Data Analysis – Statistics, Data Visualization" and the "Doctoral Seminar".

**The education program** is implemented in a semester cycle over four years. Programs and the Individual Study Track (ITK) are developed on the basis of the compliance matrix for PRK level 8. All learning outcomes must be covered by course outcomes included in the program or ITK. A single course may cover several outcomes, which leads to some redundancy compared to the minimum statutory requirements, allowing flexibility in building ITK. A doctoral student acting as project leader or contractor may apply for ITK. In addition, doctoral students are required to assign PRK level 8 learning outcomes to each task defined in the IPB. The need to independently assign outcomes to planned research activities fosters understanding of key research competencies. The achievement of a learning outcome within a course is confirmed on the basis of assessment methods specified in the syllabi.

**The multi-field and multi-disciplinary profile** of SzD fosters interdisciplinarity. For example, the program includes the mandatory course "Contemporary Trends in the Development of Science", taught over four semesters by specialists in their disciplines, presenting the current state of development. The curriculum also provides for courses common to all doctoral students, including interdisciplinary content such as fundraising and presentation of scientific achievements. An important interdisciplinary course is the Seminar, where doctoral students from different disciplines share their work. The staff of SzD represent diverse scientific fields and disciplines. The School also engages external staff, and some courses are taught by representatives of the economic environment and international lecturers. Doctoral students also actively participate in *Interdisciplinary Seminars* organized by PBŚ, aimed at experience exchange and integration of all scientific communities of the University. At least once a year, one Seminar session is dedicated exclusively to doctoral students.

**Education programs are systematically improved** based on experience from previous years and participation in trainings. The program has been modified several times:
- Doctoral School UTP, Senate resolution 10/428, 2019/2020, interdisciplinary program, identical for all disciplines, unchanged. Other versions resulted from technical requirements related to updating disciplines in the POL-on system.
- Doctoral School PBŚ – Program II, Senate resolution 7/467, 2022/2023. After analyzing programs of other doctoral schools in the country and to adapt education for international doctoral students and those involved in research projects, the overall number of hours was reduced, the sequence of courses modified, and two new blocks introduced: general electives and discipline-specific electives.
- Doctoral School PBŚ – Program II – Amendment I, Senate resolution 15/479, 03.2023. The doctoral seminar in semesters VII and VIII was combined, previously delivered separately for discipline groups; syllabi were modified by linking learning outcomes to specific course content; discipline elective courses were verified according to the availability of qualified teaching staff.
- Doctoral School PBŚ – Program II – Amendment II, Senate resolution 24/483, 07.2023. The program was extended to two new disciplines: "Chemical Engineering" and "Management and Quality Sciences", introducing appropriate elective blocks.
- Doctoral School PBŚ – Program II – Amendment III, Senate resolution 7/503, 2025. The discipline "Automation, Electronics, Electrical Engineering and Space Technologies" was excluded from the program.

Draft education programs, prepared by the Director of SzD in cooperation with Scientific Councils of the disciplines, are reviewed by the SzD Council and adopted by the Senate, with the mandatory opinion of URSD.

## 2. Method of verifying learning outcomes for qualifications at PRK level 8

The rules for verifying learning outcomes for qualifications at PRK level 8 are clearly defined by SzD and available to doctoral students. **The course syllabi** delivered within the education program contain lists of learning outcomes with reference to learning outcomes at PRK level 8 and methods of their verification. These syllabi additionally include: course content divided by semester, number of teaching hours, teaching methods and lists of literature. The syllabi are available on the Doctoral School website in both Polish and English (https://pbs.edu.pl/pl/doktorant/akty-prawne-i-dokumenty-do-pobrania). During the Doctoral Seminar in the first semester, the Regulations of SzD are presented, which include, among other things, all provisions concerning the academic year and its completion. The Regulations clearly define: criteria for passing the semester, conditions for passing courses and examinations, grading scale, issues of attendance, conditional continuation of education, and ways of accommodating the needs of persons with disabilities. In addition, lecturers present at the first class the conditions for passing each course and the methods of verifying learning outcomes. Detailed rules for **the organization of the academic year**, including the duration of semesters, examination and resit sessions, methods for setting exam schedules, methods for recording doctoral students' achievements, and the organization of professional practice, are clearly regulated by the Rector's order on the organization of the academic year for SzD.

**The transparency of the learning outcomes verification process** results from the precise selection and formalized method of determining the methods of verifying learning outcomes applicable to all doctoral students on the same terms. Education programs together with syllabi are initiated by the Director of SzD with the participation of Scientific Councils of the disciplines. After review by the SzD Council, they are submitted to the Senate, which adopts a resolution after obtaining the opinion of URSD. The transparency of the verification process is also monitored through surveys conducted each semester among doctoral students. Doctoral students stand out with a high 40% participation rate in the survey. Among the questions addressed to doctoral students are those referring to the verification process of learning outcomes, namely: Q4. Student assessment consistent with the stated criteria, Q5. Consistency of course topics and adequacy of learning outcomes with the syllabus. The results of the surveys, within the framework of the Quality Report, are presented to the SzD Council, which formulates possible recommendations for the Director.

SzD undertakes efforts to ensure the reliability of the process of improving methods for verifying learning outcomes. A mechanism supporting this process is **the quality improvement system**, which includes: a) the university's Internal Quality Assurance System (WSZJ), b) the SzD quality system defined in the SzD Regulations, c) internal management control within the university, d) the participation of SzD in the HR Excellence in Research program. Within WSZJ, periodic observations of classes and surveys on the quality of teaching are organized. Within the SzD quality system, doctoral students annually complete surveys of doctoral and graduate satisfaction, surveys on cooperation with supervisors, while supervisors complete surveys about cooperation with doctoral students. Within the management control system, the compliance of the school's activities with the law and internal procedures is examined and risk management is carried out. The summary of all these activities is included in **the annual Quality Report** prepared by the Director. The report contains, among other things, analyses of: doctoral student surveys, class observations, student evaluations, results of the mid-term assessment, removals, and defended dissertations. The SzD Council reviews the report and formulates recommendations for the Director regarding the education program and teaching staff. The results of activities carried out within the Logo HR program are included in the description of Criterion 5 on the quality of supervision of doctoral students.

The reliability of the education process in SzD, and the importance SzD attaches to achieving the required learning outcomes, is evidenced by the fact that the reason for several removals from the list of doctoral students was failure to pass a semester. Failure to pass a semester resulted from not passing courses, i.e. not achieving the required learning outcomes. Only one of the persons removed for this reason questioned the validity of the removal decision, referring the case to the administrative court. After a thorough review of the removal procedure and acceptance of SzD's arguments, the court dismissed the complaint, thus confirming the transparency and reliability of the process of verifying learning outcomes in SzD.

SzD consistently improves methods of verifying learning outcomes for qualifications at PRK level 8. The Quality Assurance Committee regularly analyzes learning outcomes in Education Quality Reports and discusses them at Quality Assurance Committee meetings. As a result, modifications are made to education programs. The first amendment to Program II consisted in modifying learning outcomes so that their meaning directly referred to the implementation of specific course content. In this way, the verification of a learning outcome by the lecturer became more measurable, and the meaning of the learning outcome more understandable for the doctoral student. The change concerned all syllabi of the education program.

The quality of learning outcome verification is also indirectly evidenced by the grades obtained by doctoral students. At the end of each academic year, SzD conducts a detailed statistical analysis of grades in the Quality Report. The analysis compares average grades: (1) obtained in individual years for each course, (2) average grades of a given cohort of doctoral students in subsequent years of education, and (3) average grades for individual years of education over time (e.g., how grades in the second year change across cohorts). In this way, it becomes possible to identify potential negative trends in the level of achievement of PRK level 8 learning outcomes, visible, for example, through a decrease in average grades.

Staff involved in teaching in SzD also **improve their competences in the area of learning outcomes**. Lecturers and supervisors of the School participate in trainings on the selection of methods for verifying learning outcomes. A significant number of lecturers and supervisors have participated in trainings under the programs “Excellence in University Teaching” and “Modern and Effective University”. The management of the School participated in the training “Formulating Learning Outcomes – Methodological Training”.

SzD recognizes the crucial importance of the Polish Qualifications Framework in doctoral education. Therefore, to ensure coherence and reliability of this process, the learning outcomes have also been incorporated into the IPB, which serves as the primary tool for planning and monitoring research progress. This approach makes it possible to link the planned research activities with clearly defined requirements regarding advanced knowledge, skills, and research autonomy. The obligation to independently assign learning outcomes to planned research tasks helps doctoral students understand which competencies are essential at this stage of qualification and highlights the general and universal nature of the outcomes defined for PQF level 8. As a result, doctoral students can better identify the broader aspects of their research work and understand its impact on the development of their scientific discipline.

Management of SzD believes that its approach to the verification of learning outcomes is effective, transparent, and subject to continuous improvement. At the same time, the School is aware of the need for further development and adaptation to changing requirements and the needs of doctoral students. The systematic collection of feedback from doctoral students through various types of surveys and the analysis of learning results allow for the rapid identification of areas requiring improvement and the introduction of appropriate changes.

## 3. Qualifications of academic teachers or research staff conducting education at the doctoral school

Courses are delivered by **experienced academic teachers** (NA). The vast majority are independent researchers with significant scientific achievements and experience in supervising academic staff. The involvement of NA in teaching at SzD is preceded by the opinion of the SzD Council. This opinion is based on the "Doctoral School Lecturer Profile" form, completed by the discipline council that nominates the academic teacher to conduct classes. One of the aspects evaluated is the lecturer's professional record. If the University does not have NA with qualifications adequate to the course program specified in the syllabus, qualified lecturers from outside the university are employed. Examples include pedagogical courses, Philosophy of Knowledge, Ethics, and Rhetoric.

The SzD curriculum has an interdisciplinary character, covering many courses common to all disciplines. Since it is not possible to present the profiles of all such lecturers, the annex containing the profiles of NA for the discipline Chemical Sciences also includes **the profiles of lecturers teaching general subjects**. This approach provides a complete picture of the teaching staff.

The SzD Office provides supervisors and lecturers with information about training and course opportunities. Thanks to this, dissertation supervisors and SzD lecturers have participated in numerous courses organized by the Professional Education Department. Within the project "Excellence in University Teaching" these included: "Management in Education and Science," "Mentoring in Practice," "The Art of Academic Teaching," and several modules on "Modern Didactic Tools" (Canva, Genially, Mentimeter, Edpuzzle, Kahoot, Wordwall, Quizlet), as well as "Problem-Based Learning." In total, 5 supervisors and auxiliary supervisors and 24 lecturers participated in this project. Within the project "Modern and Effective University," another 7 staff members took part. An example of professional development activities for supervisors is their participation in training organized by OPI on the interpretation of JSA analysis results.

The Doctoral School also participates in information meetings on successive editions of the **Doktorat wdrożeniowy** program. Such meetings are an opportunity to acquire materials and information sought by potential SzD candidates and future supervisors. On June 13, 2023, a meeting was held with representatives of the Advisory Team of the Minister of Education and Science concerning the "Industrial Doctorate" program. Issues related to annual and final reports submitted under the program were discussed.

The SzD website contains a section entitled ***Supervisor's care*** which includes:
- information useful for prospective supervisors *Information for future supervisors*;
- information for current supervisors *Information for the supervisors*. Particular attention is given to the final stage of collaboration between doctoral student and supervisor, namely the dissertation submission, including training materials on JSA and the use of the APD system for doctoral dissertations;
- the document *Good practices in the relationship between supervisor and doctoral student* developed jointly by the doctoral student council and SzD management under the Logo HR program, based on long-standing experience. The analysis of surveys conducted by SzD on the cooperation between doctoral students and supervisors showed that the appropriate attitude and effective communication of both parties are crucial for the timely submission of the dissertation and a successful doctoral defense.

Within the **Internal Quality Assurance System** (WSZJK), two tools are used to verify the qualifications of SzD lecturers: the procedure of teaching observations (hospitacje) and anonymous doctoral student surveys. Observations are carried out at least once every two years for each lecturer and in the first year of employment. They are conducted by the SzD Director. The observer evaluates whether the lecturer: was prepared for classes and the content delivered was consistent with the syllabus; used appropriate materials and teaching aids; treated students with respect; encouraged active participation; was open to student suggestions; and communicated clearly and correctly. Course evaluation surveys are conducted every semester. Unlike WSZJK recommendations, all surveys are analyzed, even when filled in by fewer than five students, due to the small size of doctoral groups. Results of observations and surveys are compiled into the annual **Quality of Education Report** and discussed at SzD Council meetings. Experience shows that the opinions of the observer and doctoral students regarding lecturers' qualifications are consistent, and both usually rate SzD lecturers' knowledge, skills, and attitudes as very high.

If survey results reveal unsatisfactory evaluations of teaching quality, the SzD management discusses the issue with the lecturer. The procedure also allows contacting the dean of the lecturer's faculty for clarification or intervention. In cases of concerns about supervisory quality, the school's management holds discussions with both the supervisor and the doctoral student. During the evaluation period, such intervention occurred twice. The issue in both cases was lack of cooperation and mutual trust. In one case, the doctoral student was ultimately found to have failed to meet obligations, resulting in removal from the program. The legality of this decision was confirmed by the Voivodeship Administrative Court, which dismissed the doctoral student's complaint. In the second case, the doctoral student decided to continue working with the supervisor.

SzD considers its approach to ensuring high staff qualifications comprehensive and effective. Systematic actions in the selection, development, and verification of teaching staff contribute to maintaining high-quality education. At the same time, SzD is aware of the need for continuous improvement in this area and remains open to creating new opportunities for staff competence development.

## 4. Quality of the recruitment process

**Recruitment documents** include: the resolution of the PBS Senate entitled *Rules for admitting candidates to the first year of education in the Doctoral School*, and two Rector's orders: on admission limits and the recruitment schedule, and on the appointment of recruitment committees.

The recruitment rules describe the procedure for submitting documents, the procedure for appointing the recruitment committee, the rules for classification and admission of candidates to SzD, the procedure for announcing results, the procedure for appeal against a negative recruitment decision, and the rules for supplementary recruitment.

General information on recruitment is **available on the SzD website** under the *Recruitment* tab at least five months before the recruitment date. There are also links to further information and documents: rules of recruitment, deadlines and admission limits, compositions of recruitment committees, regulations and curriculum of SzD, together with all downloadable forms under the link redirecting to the *Legal acts and documents for download* tab. Recruitment results are posted directly under the *Recruitment* tab. There is also a link to the *Scientific disciplines* page, which contains supporting information related to the choice of discipline for the dissertation and the choice of future supervisor. There, the candidate will find, among other things, information on the research topics of individual disciplines, contact details of the chairs of discipline councils, and a list of potential supervisors. Candidates may also directly contact selected persons to define their development opportunities at SzD.

The website tabs *What is the Doctoral School?*, *Education process* and *Mid-term evaluation* contain all the information giving candidates a full picture of SzD and the course of the education process. Candidates make frequent use of the information in the *Contact* tab, which allows direct consultation with the doctoral school's office and management by e-mail, telephone, or in person. Information is provided in Polish and English.

**The classification procedure** of candidates for SzD is based on the ranking of the total points obtained for the following criteria:
- final degree grade,
- compatibility of the field of study with the scientific disciplines represented in SzD,
- candidate's research plans,
- declaration of support from a socio-economic environment entity,
- previous scientific activity,
- assessment of candidate's self-presentation,
- course of the admission interview.

An important qualitative element of the candidate's evaluation is his or her previous scientific activity. The committee assesses various types of scientific activity, namely:
- candidate's published scientific articles,
- active participation in a scientific conference,
- possession of patents, utility or industrial designs,
- participation in research projects obtained through competitions organized by national and international agencies funding scientific and R&D activity.

As part of the assessment of the candidate's research plans, the recruitment committee verifies whether the candidate has support from a socio-economic entity, e.g. in the form of access to research equipment or co-financing of research. This applies, among others, to candidates whose scholarships are funded from external sources, e.g. research agencies. It should be emphasized that since the 2022/2023 academic year, recruitment has been directed exclusively to candidates designated as participants in research projects. As a result, the qualification procedure applies only to candidates who have already been positively verified by the competition committee of the respective project.

Candidates whose scholarships are funded from external sources may apply throughout the year. For these candidates, the Rector sets a separate limit. For foreign doctoral students, recruitment is conducted in English and, if the candidate does not reside in Poland, it takes place remotely.

A necessary condition to begin the recruitment process is the submission of **a declaration of the future supervisor** and **a draft research plan**. This condition is part of the mechanism ensuring high effectiveness of education. It is assumed that a candidate who has already begun working with a potential supervisor can present a research plan that is feasible within a four-year period of study.

Potential candidates are reached by SzD via its website, e-mails sent to PBŚ master's students, contacts with employers interested in the scientific development of their employees, as well as PBŚ research project leaders.

**Admission** takes place through a competition based on the results of the classification procedure and has the character of a ranking list of total points obtained by the candidate. Admission to the first year of SzD is within the admission limits set by the Rector's order. The proposal of admission limits is submitted by the discipline councils.

**Members of the recruitment committee** may only be independent academic staff. The committee cannot include persons indicated by the candidate as potential supervisors. The committee must include at least one person representing the scientific discipline to which the candidate applies, proposed by the relevant discipline council. A representative of URSD participates in the committee without voting rights.

If **a person with disabilities** requests it, recruitment may be conducted remotely or in a stationary mode in a room adapted to the needs of persons with motor disabilities. On the website, in the *Recruitment* tab, there is information for candidates with disabilities on the possibility of adjusting the time and place of the admission interview. The SzD office is equipped with a hearing support device based on an induction loop system for people with hearing aids. The candidate also has access to information on architectural accessibility. Thus, the university website containing recruitment information meets the accessibility criteria in accordance with the Act of 19 July 2019 on ensuring accessibility for persons with special needs. Before the admission procedure begins, committee members become acquainted with a **practical guide on savoir-vivre towards persons with disabilities**. These rules are available to all employees of PBŚ on the university's website.

**The candidate's predispositions** are assessed through:
- verification of the candidate's previous scientific achievements,
- examination of the characteristics of the candidate's research plans,
- an admission interview with the candidate.

Scientific achievements include published scientific articles scored by MNiSW, active participation in scientific conferences, obtaining a patent or utility model, and participation in research projects. As part of the characterization of the candidate's research plans, the draft research plan and the declaration of support from a socio-economic entity for the implementation of the candidate's research plans are examined. The declaration of support is particularly important as it demonstrates the involvement of a third party, which indicates trust and confidence in the candidate's potential. During the interview, the Committee assesses the candidate's level of scientific competence, understood as the ability and willingness to use existing knowledge resources to explain the world, formulate questions, and draw conclusions based on evidence and principles of logical reasoning. In addition, it assesses entrepreneurial attitude, learning skills and willingness, and the ability and readiness to acquire knowledge.

Each year, the school conducts **an analysis of the recruitment process**. Data on the number of candidates and admitted doctoral students are analyzed, and the scoring of candidates' achievements is discussed. The recruitment report, along with a list of elements to be modified in the following academic year, is presented to the SzD Council. Examples of modifications to recruitment rules in recent years included:
- Recruitment 2020/2021 – introduction of admissions in English, change in the scoring of the "type of scientific activity" criterion; removal of the previous supervisor's opinion as a criterion and its replacement with a declaration from the future supervisor; increase of the positive qualification threshold from 15 to 25 points.
- Recruitment 2021/2022 – expansion of the catalogue of disciplines; requirement for discipline councils to determine the number of admission places; introduction of the obligation to present a bachelor's diploma to broaden verification of field-discipline compatibility; provision of recruitment during the academic year for candidates indicated as executors in research projects obtained through competitive calls and funded from external sources, if foreseen by the grant evaluation schedule; introduction of points for patents; raising the qualification threshold to 30 points.
- Recruitment 2022/2023 – requirement to provide NAWA certification of recognition of foreign diplomas in Poland for candidates holding a foreign diploma; modification of the scoring system for scientific achievements; introduction of additional points for the declaration of support from a socio-economic entity in implementing the candidate's research plans, e.g. through access to research equipment or co-financing of research (resulting, among others, from participation in a research project); in line with SzD mission and Rector's order, the admission limit for candidates without external funding was set at 0; Due to difficulties in verifying the language certificates submitted, the decision was made not to award points for them.

## 5. Quality of scientific or artistic supervision and support for conducting scientific activities

The procedure for appointing and changing supervisors is defined in §15 of the SzD Regulations. A requirement of the recruitment procedure is the submission by the candidate of a proposed supervisor and a draft research plan. The existence of prior documented cooperation between the candidate and the supervisor is an important indication of the doctoral student's and future supervisor's commitment. **Supervisors are appointed by the Scientific Discipline Councils** (RND) on the basis of a doctoral student's application, submitted within 30 days of commencing education. The application includes the opinion of the SzD Director, who verifies the quality of the supervisor's cooperation with previous doctoral students. The application, together with the research plan submitted by the doctoral student during recruitment, is sent by SzD to the RND, which appoints the supervisor within three months of the start of education. To ensure the highest quality of cooperation between supervisor and doctoral student, the SzD Regulations specify the criteria that the RND should apply when appointing a supervisor.

The Regulations grant the doctoral student the right to apply to the RND for a change of supervisor, the appointment of a second supervisor, or the dismissal of a supervisor. In cases where the supervisor is unable to continue, particularly due to death, long-term illness, or resignation, the doctoral student is obliged to immediately submit an application for a change of supervisor. The application is forwarded to the relevant RND for further processing. When applications for change or dismissal of a supervisor are submitted, the SzD Director examines whether conflicts between the supervisor and the doctoral student have occurred.

**The emphasis on high-quality supervisor–doctoral student cooperation** begins at the recruitment stage. The requirement to submit a jointly prepared research plan initiates good relations between the parties. In the case of appointing an auxiliary supervisor, the plan also requires the opinion of that supervisor. The annual report on IPB implementation must also be approved by the supervisor, who evaluates the report for the mid-term assessment. The procedure for completing education at SzD likewise requires the supervisor's opinion and approval of the doctoral dissertation, preceded by JSA verification. It is worth noting that anonymous surveys on doctoral student–supervisor cooperation are conducted annually.

The SzD website provides **information for prospective and current supervisors**, such as: *Information for future supervisors*, *Information for the supervisors*, *Good practices in the relationship between supervisor and doctoral student*, *Stages of approval of a doctoral dissertation in the APD system*, and OPI *JSA Training*. **SzD facilitates cooperation between supervisors and PhD students** through direct meetings with school management. For example, in January 2024 and 2025, individual meetings were held with doctoral students who had been granted extensions and with their supervisors. In cases of conflict, the SzD Director conducts discussions with the supervisor or doctoral student to resolve issues. SzD also intervenes in difficult situations not necessarily related to conflicts with supervisors.

SzD ensures that doctoral students have proper conditions for the implementation of their IPB and education program. SzD ensures proper conditions for doctoral students to prepare their dissertations. **Access to the university's research infrastructure** is guaranteed under Senate Resolution 7/378. Furthermore, according to the SzD Regulations, in the supervisor appointment procedure the chair of the relevant RND declares support for the implementation of IPB, including access to research infrastructure. In the same document, the supervisor undertakes to provide scientific supervision diligently and conscientiously, in line with the highest standards and norms. Doctoral students may obtain additional funding from the university under the **Scientific activities of young people** (DNM) program. Grants of up to PLN 15,000 may be awarded. In the three editions held so far, 27 doctoral students have received funding, with a total of over PLN 321,000 awarded and an average grant size of PLN 12,000. The university provides each doctoral student with access to Matlab, Statistica, Office 365 (office programs, cloud storage, and MS Teams).

Doctoral students are entitled to apply for ITK, suspension of studies (e.g., for parental leave or illness), modification of IPB, and an extension of the dissertation submission deadline, not exceeding two years, in justified cases specified in the Regulations. In particularly justified cases, at the written request of the doctoral student, teaching activities may be carried out exceptionally using distance communication methods and techniques. According to the Regulations, sign language interpreters and assistants for persons with disabilities may participate in exams. Assistants helping doctoral students with disabilities must have the Director's approval to participate in exams and assessments. Doctoral students with disabilities may, no later than 7 days before the start of the examination session, request adjustments such as changes to exam dates or converting a written exam into an oral one.

If a doctoral student fails to pass one subject, the Director, at the student's request, may grant conditional continuation of studies in the next semester. The student must pass the subject no later than the end of that semester. SzD considers each doctoral student's problems individually, taking family circumstances into account. According to the Regulations, supervisors may be changed during the course of study. SzD may take this into account in the mid-term evaluation by allowing less than 50% completion of IPB, or, under provisions for problems not caused by the doctoral student, by extending the dissertation submission deadline.

Specialists from industry and visiting academic staff from the Erasmus program are invited to participate in the educational process. As second supervisors or auxiliary supervisors, specialists working outside PBŚ, including from abroad (about 10% of doctoral students), are also engaged.

**To evaluate supervisors' work**, SzD conducts two types of surveys annually: the first allows doctoral students to provide feedback on cooperation with supervisors, and the second gathers supervisors' opinions on cooperation with doctoral students. The results are presented in the Quality Report at SzD Council meetings. Based on them, the Director may formulate opinions on supervisors in applications for their appointment. Improving the quality of supervisors' work is also pursued by SzD under the Logo HR program. In cooperation with the doctoral student council, and for the purpose of the Logo HR application, the document *Good practices in supervisor–doctoral student relations* was prepared.

## 6. Integrity of the mid-term evaluation process

The course and **criteria of the mid-term evaluation** are defined in §§16–17 of the SzD Regulations, published on the SzD website and in the BIP. An annex to the Regulations contains the template of the Mid-term Evaluation Committee (KOŚ) protocol. It serves as an additional source of information for doctoral students regarding the procedure and conditions of the mid-term evaluation. In addition, the criteria are discussed at doctoral seminars: in semester I during the presentation of the Regulations and in semester IV as preparation for the mid-term evaluation.

**The committee** is appointed by the Director from among candidates indicated by the RND, after the SzD Council has given its opinion on these candidates. KOŚ consists exclusively of independent academic staff with experience in training research personnel. The supervisor and auxiliary supervisor may not be members of KOŚ. As required by law, one KOŚ member is from outside the university. At SzD, the evaluation is held after the fourth semester, no later than 31 October of semester V. For students recruited mid-year, the date is set individually based on the IPB schedule so that, in line with PSWiN, it falls at the midpoint of their education.

After KOŚ is appointed and before its formal meeting, **SzD management holds a briefing with committee members**. The schedule, access to documentation, the protocol template, and the essence of the mid-term evaluation—roles, tasks, and guidelines for KOŚ—are discussed. Members are also informed about the need to review the Fair Play rules (anti-mobbing and anti-discrimination guides) and the *Savoir-vivre* guide for persons with disabilities. The chair answers questions. After this meeting, members receive access to the PhD student's documentation.

During the KOŚ meeting:
1) the doctoral student's IPB progress report is discussed;
2) the supervisor's (or supervisors') opinion on IPB progress is discussed;
3) the doctoral student presents a self-report on IPB;
4) a discussion follows, during which questions are asked;
5) the mid-term result is determined by open vote, simple majority.
Parts 1, 2, and 5 are conducted without the doctoral student present.

The committee determines the percentage of completion of the dissertation. This is set during deliberations based on the annual reports, the self-report, the written supervisor's opinion, and the discussion. In setting the result, the committee examines whether:
- all IPB tasks planned for the first two years were completed;
- assesses partial completion;
- establishes reasons for non-completion and whether they were beyond the student's control;
- checks whether remedial measures or a corrective plan were adopted;
- determines whether incomplete tasks are still feasible or whether the IPB should be changed;
- verifies that IPB includes mandatory tasks;
- and assesses consistency between the supervisor's opinion and the IPB report, asking the student to explain discrepancies.

**The mid-term evaluation ends with a protocol**. In it, KOŚ members assess the degree of IPB implementation and formulate remarks on the supervisor's opinion. This section may be filled out before the meeting, and after briefing with SzD management, in the online protocol. At the meeting, KOŚ jointly assesses the self-report, agrees the final protocol text, and determines the result. The protocol is made **available to the PhD student and the supervisor**.

Information on the result and its justification is published by SzD in the BIP. The doctoral student may appeal to the SzD Director within 14 days from publication in the BIP; KOŚ issues an opinion on the appeal. The Director decides within 30 days of submission. The Director's decision is final. A summary of mid-term results is also included in the *Quality of Education Report*.

In 2022, the mid-term procedure was reviewed by the law office *Kancelaria prawa akademickiego Łukasz Kierznowski*, which affected its conduct. Initially, KOŚ was also expected to assess the quality of the education process and of the IPB, treating the mid-term as a kind of "opening of the doctoral procedure" with a content evaluation. Following the legal opinion, assessment of IPB quality and analysis of learning outcomes were removed from the scope. The protocol template was also modified; since 1 October 2023 it has formed an annex to the SzD Regulations.

During the evaluation period, SzD evaluated 53 doctoral students: 11 in 2021, 20 in 2022, 20 in 2023, and 2 in 2024. In the first three years the numbers of negative results were 3, 2, and 1, respectively; all students appealed. Notably, the number of negative results fell year by year. After appeals, the first cohort had 2 negative results, the second 1, and in 2024 there were

none. The average percentage completion of the dissertation determined by KOŚ rose annually: 41% in 2021; 51% in 2022; 53% in 2023; 65% in 2024.

The mid-term evaluation at SzD is based on clearly defined and accessible criteria described in the Regulations and discussed with students at seminars. It focuses solely on the degree of IPB implementation and relies on a comprehensive analysis of the student's documentation and the supervisor's opinion. The committee is composed of experienced, independent researchers and is carefully constituted. The process is carried out on schedule and concludes with a protocol shared with the student and supervisor. To improve the procedure, it is regularly reviewed and modified, including legal consultation, enabling continuous enhancement in line with current academic standards.

## 7. Internationalization

International activity is an integral feature of the research and teaching staff of the University of Technology engaged in doctoral education. In the fields and disciplines represented by this staff, scientific development requires publishing in renowned international journals, participation in international scientific conferences, and cooperation within international research teams. The annex presenting the profiles of academic teachers (NA) involved in SzD education contains numerous examples of international activity, such as participation in international grants, research internships and fellowships abroad, membership in international scientific societies, and international awards. In addition, the university organizes informational meetings on international research competitions addressed to PBŚ staff, including SzD employees.

The implementation of IPB is also supported by **international staff**. About 10% of SzD doctoral students have a second or auxiliary supervisor from abroad. Since its second year of operation, SzD has conducted **education in English** for international doctoral students, and the degree of internationalization of education has increased annually. During the evaluation period, the proportion of foreign students relative to Polish ones was 18%.

An important element of SzD **education is English language** instruction, delivered during the first four semesters for a total of 60 hours. Proficiency at the B2 level of the CEFR is confirmed by the exam specified in PSWiN. English classes are taught by qualified staff, including native speakers, Fulbright grantees in academic years 2021/2022 and 2022/2023. Their profiles are included among the teacher profiles for SzD general courses.

In their IPB, doctoral students are required to plan active participation in a conference, complete a research internship or study visit at a research unit, and publish at least one scientific article. Many doctoral students participate in conference and internship trips. These tasks may be implemented under the University's Erasmus+ program or financed by internal grants such as "Young Researchers' Scientific Activities" and other research projects. Like University staff, doctoral students publish their work in international journals. Doctoral dissertations resulting from IPB are also written in English, and defenses in such cases are conducted in this language.

Lectures by visiting international scholars are organized for doctoral students, often within Erasmus. Examples include lectures: *Data Mining and An Implementation in HR, Department of Industrial Engineering*, Yalova University, Turkey, 21.05.2024; *Multi-Criteria Decision Making*, KTO Karatay University, Dept. of Industrial Engineering, Turkey, 13.06.2023.

Foreign doctoral students receive SzD support in handling administrative matters at and beyond the University. The SzD office provides guidance, information, and assistance in English with visa, residency, and scholarship issues. It is worth noting that the office is rated very highly by foreign doctoral students. The SzD **website is bilingual Polish and English**, and the MS Teams communication channel for doctoral students also includes information in English. Doctoral students can count on English-speaking staff at the Student Residences and additional assistance from the Welcome Center. A doctoral student from abroad was one of the participants in the official events related to the opening of the above-mentioned unit.

SzD is a partner in **agreements with foreign universities** from Kazakhstan and Spain. These agreements define cooperation conditions in doctoral education, such as participation in joint training programs and mutual review of research papers. An agreement was signed on joint scientific supervision of the preparation of a doctoral dissertation by a doctoral student from Brazil. These initiatives aim to raise educational standards and develop international research networks among early-career scholars.

**SzD has undertaken initiatives to further internationalization**. Twice, it applied to NAWA's STER program. The application planned the following actions: a) recruitment of international doctoral students; b) NAWA scholarships for the best Polish and foreign doctoral students conducting projects in international cooperation; c) support for international mobility of the best doctoral students; d) "internationalization at home". Funding was not granted, as the project's expected impact on SzD's internationalization was assessed as "moderate." In 2024 SzD withdrew from applying again due to foreign partners' resignation, caused by the legal impossibility of issuing a joint doctoral diploma in Poland. In addition, **the Doctoral School benefits from the university's membership in international organizations** (BUP, VUA, ESSSR) whose activities include events dedicated to doctoral students. This allows for increased recognition of the Doctoral School among other members of the above-mentioned groups and people interested in their activities. The university's promotional materials prepared for foreigners contain information about the activities of the Doctoral School. One example of this type of content is a trilingual guide, financed as part of the project *Welcome to PBS – adapting the Bydgoszcz University of Technology to receive and serve students and staff from abroad* distributed in paper and digital form to a wide audience. Information about the International Relations Office is also included in a multimedia presentation shown during official visits by foreign guests (representatives of academia, foreign authorities, and the private sector) and during trips abroad by PBS employees.

Strengths of SzD's internationalization include the percentage of foreign doctoral students, the involvement of foreign auxiliary supervisors, and strong administrative support for international students. Weaknesses include the relatively low participation of foreign lecturers in teaching. SzD has attempted to change this by seeking external funding through STER. The greatest obstacle to internationalization remains the provisions of PSWiN, which prevent issuing a joint doctoral diploma by two institutions. Another weakness is limited doctoral student mobility within Erasmus+: during the evaluation period, only one doctoral student used this opportunity.

## 8. Effectiveness of doctoral education

| Percentage of individuals who obtained a doctoral degree | Doctoral students who applied for initiation of proceedings for the award of a doctoral degree | Doctoral students who were awarded a doctoral degree | Doctoral students who were denied the award of a doctoral degree |
|---|---|---|---|
| in the number of doctoral students who completed their education at the doctoral school during the evaluation period | 100 % | 83 % | 0 % |
| in the total number of doctoral students who completed their education at the doctoral school | 58 % | 48 % | 0 % |

During the evaluation period, 16 PhD students were granted an extension of the dissertation submission deadline; 18 submitted dissertations, including **5 ahead of schedule**; 15 obtained the PhD degree (83%), while 3 procedures are ongoing; 4 failed to submit dissertations within the deadline, incl. the extended one, and were removed from the list of PhD students.

For those on extensions and their supervisors, meetings were organized to monitor the progress of the dissertation and motivate them to meet the new deadline. The progress of dissertation preparation is also monitored at the seminar.

Effectiveness of education:
- 2019: 5 completed, 4 obtained the degree, effectiveness 80%;
- 2020: 9, 9, 100%;
- 2021: 3, 2, 67%;
- 2022: 1, 0, 0%.

SzD monitors the level of PhD students' scientific achievements, particularly related to IPB. In addition to research tasks, PhD student must complete 5 mandatory activities: submission of a publication meeting PSWiN requirements, a grant application, a dissertation, active participation in a scientific conference, and a research internship. **10 dissertations were recognized as outstanding**. No degree conferral has been refused.

The effectiveness of education is subject to continuous quality evaluation. Each year SzD conducts four types of surveys: evaluation of courses, cooperation with supervisors, study conditions at SzD, and satisfaction of PhD and graduates. These data are used to monitor the quality of education through the annual report. Based on the report, the SzD Council makes decisions regarding the teaching. The Director responds to survey results by contacting lecturers or the Dean.

SzD independently monitors started procedures and awarded degrees. Applications to start the doctoral degree procedure were submitted without delay. SzD collects information on employment, especially at universities and other research institutions. After 2 years, SzD collects information from graduates and uses it to modify the education program.

## 1. chemical engineering

Achievement Description

The discipline has not yet achieved any results because the first and only candidate to date was recruited only for the 2025/2026 academic year, i.e. from October 1, 2025, and has 12 months from the start of their education to submit their IPB.

## 2. mechanical engineering

Achievement Description

1. **Title of the achievement:** Verification of selected hypotheses of fatigue damage accumulation in the high- and gigacycle

range

**Author:** Piotr Swacha, M.Sc., Eng., Supervisor Adam Lipski, PhD, DSc, Eng.

**Description of achievements:**
The research problem undertaken as part of the doctoral dissertation concerns fatigue tests and estimation of fatigue life in the range exceeding the classic limit of 10 million load cycles, with the use of a system that allows economically justified research in this area. This system, equipped with an ultrasonic testing machine operating at a load frequency of 20 kHz, has advanced and unique research capabilities, which combined with the lack of methods for estimating fatigue life in the gigacycle range in the available world literature, e.g. based on the hypothesis of fatigue damage accumulation, indicates the innovative nature of the planned work.
The detailed scope of the research includes:
a) determination of the basic strength properties of selected materials,
b) verification of the geometry of test specimens by modal analysis using the finite element method,
c) determination of fatigue characteristics of selected materials in the high- and gigacycle range,
d) programmed fatigue tests in the high- and gigacycle range,
e) verification of selected hypotheses of fatigue damage accumulation on the basis of programmed tests,
f) fractographic studies of sample breakthroughs, including with the use of SEM,
g) development and implementation of a method for estimating fatigue life in the gigacycle range.
The research and analyses carried out as part of the work enabled the implementation of a research procedure for fatigue tests in the gigacycle range, which was subsequently introduced into its scope of accreditation, in the Laboratory for Materials and Structures Testing of the Faculty of Mechanical Engineering of the Bydgoszcz University of Technology, accredited by the Polish Centre for Accreditation (accreditation AB 372). The subject of fatigue tests in the gigacycle range is part of the discipline of "mechanical engineering" and is a new branch of research in relation to national research teams. The scope of research, analysis and verification planned as part of the doctoral dissertation is also largely a novelty compared to the achievements of foreign research centers dealing with this subject. The research procedure for fatigue tests in the gigacycle range, developed and implemented as part of the doctoral thesis in an accredited laboratory, combined with its extensive research capabilities, is an important element of the transfer of the latest scientific achievements to industrial practice, and the analyses and results of these works have been described in the following studies and included in the patent application:
1. Swacha P., Lipski A., Piotrowski M.: Determination and experimental verification of the relation between stress amplitude and vibration amplitude in the VHCF regime. In: Pyrzanowski P., Papis M., Experimental Mechanics. Materials Research Proceedings, Vol. 30, Materials Research Forum, Millersville PA, USA, 2023, pp. 75-82.
2. Swacha P., Lipski A.: Cracking of S355J2+N steel in the high-cycle and very-high-cycle fatigue regimes. International Journal of Fatigue, Vol. 168, 107388, 2023, pp. 1-10,DOI: 10.1016/j.ijfatigue.2022.107388 (IF: 5,7; Number of citations as of 15.10.2024: Scopus – 5, Web of Science – 1).
3. Lipski A., Witek M., Abdelghani M., Swacha P.: Influence of Plastic Strain on Heat Capacity of L485ME Pipe Steel Grade. Energies, Vol. 17, Issue 7, 1554, 2024, DOI: 10.3390/en17071554 (IF: 3.0).
4. Mroziński S., Swacha P., Ziółkowski W., Stachowiak R., Piotrowski Basak L., Piwoński M.: A device for applying a controlled clamping force during the process of coating shafts with elastomers. Patent No. 73203, Grant of protection: 2023.12.04 WUP.

**2. Title of the achievement:** Selection of structural features of a leaf with a variable profile on the example of UAV

**Author:** Andrzej Świtała, MSc, Eng., Supervisor Adam Lipski, PhD, DSc, Eng.

**Description of achievements:**
The research problem concerns an innovative design of a wing with a variable profile that can be used in the construction of unmanned aerial vehicles. The main objective of the work is to develop a design of a wing with a variable profile along with the determination of its operational characteristics and their experimental verification. A secondary objective of the study is to analyze the possibility of using laminates with an elastomeric matrix for this type of sash. The use of a wing with a variable profile should allow to increase the reliability of this type of aircraft.
The research and analysis program includes:
a) development of a UAV wing design with a variable profile,
b) development and strength tests of a composite material with the assumed properties intended for the wing skin,
c) strength calculations of the wing using the finite element FEM method,
d) aerodynamic calculations of the wing using the finite element FEM in order to determine its characteristics depending on the parameters controlling its geometry,
e) experimental verification of forces acting on the wing with a variable profile,
f) strength and fatigue tests of the wing with a variable profile.
The use of flexible structures is one of the latest trends in the design of aircraft structures. The use of the variable airframe geometry obtained in this way requires the reconciliation of many conflicting technical requirements. The structure should

be rigid on the one hand, to make the most of the strength of the materials used, and on the other hand, flexible, otherwise it would not be possible to control it. A standard solution is to design a system of rigid articulated elements. However, as the requirements for the efficiency of such a design increase, the disadvantages of such solutions are revealed, which include, m.in others, a significant increase in aerodynamic drag or an increase in the possibility of stalls. The use of fully elastic structures allows to avoid problems related to rapid changes in geometry, but causes difficulties in achieving the required stiffness or aeroelastic parameters.
The study presents a methodology allowing for the creation of variable wing geometry based on flexible structures and a proposal for such a solution taking into account the control mechanism. The subject matter of the research and analysis carried out is within the scope of the discipline of *mechanical engineering*, and the results obtained as a result of the work provide new knowledge, allowing for the formulation of answers to the research questions posed in it. One of the examples of popularizing the results of the discussed work was their presentation at a scientific symposium: **Świtała A.**, Lipski A., Application of elastic structure in the construction of variable wing geometry. Poster presentation as part of the XXXI Symposium on Fundamentals of Machine Design, Szklarska Poręba, 2023

**3. Title of the achievement:** Shaping the structure and properties of polyamide-based composites in the process of microporous injection

**Author:** Bartosz Nowinka, M.Sc., Eng., Supervisor Dariusz Sykutera, PhD, DSc, Eng.

**Description of achievements:**
The most important scientific achievements of Mr. Bartosz Nowinka, M.Sc., Eng., include:
a) obtaining thick-walled, porous composites on a polyamide matrix PA66GF30 with reduced processing shrinkage and selected strength properties improved compared to solid material,
b) demonstration of the possibility of producing moulded parts of significant thickness, free from processing defects, containing in their volume uniformly distributed gas pores of very small size,
c) to describe the relationships between the applied values of the microporous injection molding process parameters and the mechanical properties, apparent density and primary shrinkage of thick-walled PA66GF30 composites,
d) development of an amendment concerning the Charpy impact determination method for thick-walled specimens,
e) Demonstration of the relationship between the values of the process parameters of enveloping injection, porous structure and mechanical properties related to apparent density. In this respect, a great achievement of the dissertation is the confirmation of the impact of the simultaneous action of at least two input variables on obtaining a microporous structure that is beneficial due to the mechanical properties of PA66GF30 composites.
A description of the PhD student's achievements has been included in the papers presented below, and their results have been presented at distinguished conferences and symposia. At the same time, it should be emphasized that the PhD student completed a foreign scientific internship, is a co-contractor of research projects, patent, commissioned research, winner of 2 Gold Medals at trade fairs and winner of the title of Innovation Leader of Pomerania and Kujawy 2020.

**List of publications:**
1. Bieliński, M., Chrapkowska, J., Czyzewski, P., & Nowinka, B. (2024). Influence of electrical discharge machining of the molding cavity on the surface condition of filled polymer moldings. AIP Conference Proceedings, 3130(1). https://doi.org/10.1063/5.0203487/3279831
2. Rojewski, M., Nowinka, B., & Czyżewski, P. (2024). 3D Optical and Mechanical Roughness Measurements of Complex and Irregular Structures on the Basis of Polypropylene Moldings. Advances in Science and Technology. Research Journal, 18(5), 245–257. https://doi.org/10.12913/22998624/189778
3. Czyżewski, P., Rojewski, M., Nowinka, B., Szewczykowski, P., & Detmer, K. (2024). Influence of forming cavity various surfaces parameters on the effects of laser processing on the polymer moldings. AIP Conference Proceedings, 3130(1). https://doi.org/10.1063/5.0205032
4. Polasik, R., Troszyński, A., Nowinka, B., & Matiukh, S. (2023). Diagnosing of the Glass Fiber Reinforced Polymer Material High Performance Drilling Process State. MATEC Web of Conferences, 375, 01003.

## 3. civil engineering, geodesy and transport

Achievement Description

**1. Title of the achievement:** Investigation of the strength of precast concrete slabs with the use of high-strength reinforcement in special conditions.

**Author:** Paweł Majkowski

**Rationale:** Precast reinforced concrete structures are playing an increasingly important role in construction, and optimizing their strength properties is crucial. The research concerns the use of B600B reinforcing steel, the properties of which have been confirmed both in numerical and experimental analyses. These results are important due to the possibility of increasing material efficiency and reducing the negative impact of steel production on the environment. The thickness of the panels has a major impact on their behavior under load, which affects the safety of the structure and the optimization

of the construction process.

**Evidence:**
- 68th Krynica Scientific Conference of the Committee on Civil Engineering of the Polish Academy of Sciences and the Science Committee of the Polish Association of Civil Engineering, Gliwice, 2023 (national conference). Presentation: "Numerical and experimental analysis of precast concrete slabs with high-strength reinforcement under specific support conditions".
- Dutkiewicz Maciej, Griniov Vadim, Majkowski Paweł Krzysztof, Numerical and experimental analysis of the precast concrete slabs reinforced with high grade steel bars with special supporting conditionsMateriały Budowlane 2/2024, pp. 21-25, DOI: 10.15199/33.2024.02.05, MNiSW score: 100.

**2. Title of the achievement:** Evaluation of the possibility of using non-metallic composites as an alternative to reinforcing steel in concrete elements.

**Author:** Paweł Majkowski

**Rationale:** The increasing popularity of composite reinforcement in concrete structures is due to its numerous advantages, such as higher corrosion resistance and higher tensile strength. Examining different types of composite fibers and benchmarking with traditional steel rebar enables more informed decision-making in the design process. Key risks associated with the use of composites, such as fire resistance, are also discussed in detail, highlighting their potential use and risks in construction.

**Evidence:**
- WMCaus - 8th World Multidisciplinary Civil Engineering – Architecture – Urban Planning Symposium, Prague, Czech Republic, 2023 (international conference), "Benefits and risks of application of non-metallic composites as an alternative to steel reinforcement in concrete elements".

**3. Title of the achievement:** Rolled concrete technologies and their application in road surfaces

**Author:** Przemysław Stałowski

**Rationale:** Rolled concrete (RCC) is a modern technology used in road surfaces that offers greater durability, wear resistance, as well as environmental benefits such as recyclability and a smaller carbon footprint compared to traditional asphalt surfaces. The research and presentations focused on various RCC configurations, from expressways to local housing estate and forest roads, taking into account the methodology of designing the concrete mix, its proper compaction and the impact of optimal consistency on the durability of the pavement.

**Evidence:**
- LXIV Technical Road Days, Łódź, 2023 (national conference), presentation: "Concrete surfaces in practice and directions of development".
- X Krakow Pavement Days, Krakow, 2023 (national conference), presentation: "Rolled concrete in practice – from preparation to execution".
- Publication: MATEC Web of Conferences 396, 01001, DOI: 10.1051/matecconf/202439601001, MNiSW score: 5.000.

**4. Title of the achievement: Application of Rolled Concrete (RCC) in Parking Lot Design**

**Author:** Przemysław Stałowski

**Rationale:** Due to the growing number of vehicles, rolled concrete (RCC) is an alternative to traditional asphalt pavements in parking lots. Its use ensures greater durability, lower maintenance costs and ease of recycling. It is crucial to properly prepare the ground to guarantee the longevity and high quality of the surface of car parks in this technology.

**Evidence:**
- Publication: MATEC Web of Conferences 396, 01001, DOI: 10.1051/matecconf/202439601001, MNiSW score: 5.000.

## 4. agriculture and horticulture

Achievement Description

**1. Title of the achievement:** National Patent

**Author:** PhD student: PhD student Krzysztof Pietrzykowski, MSc, Eng., supervisor Edward Wilczewski, PhD, DSc, Eng., prof. PBŚ

**Evidence:**
"A method of obtaining adventitious shoots of *the Astrophytum myriostigma* 'Fukuryu Hakuyo' cactus from in vitro cultures". Authors: Lema-Rumińska Justyna, Pietrzykowski Krzysztof; Year of approval: 2019. Patent No.: 233253.

**Description:**
Importance of the achievement in the context of agriculture and horticulture/ Description of the innovation and its potential impact: The advantage of the solution according to the invention is obtaining a large number of adventitious shoots of *the Astrophytum myriostigma* 'Fukuryu Hakuyo' cactus in only 12-16 weeks under in vitro culture conditions. In subsequent passages, the obtained number of new adventitious shoots increases at a geometric rate. The proposed solution allows to obtain adventitious shoots ready for further rooting, acclimatization and greenhouse cultivation, horticultural crops, horticultural production, hobby crops. The patent was awarded a silver medal at the INTARG international fair in 2020.

**2. Title of the achievement:** Scientific publication

**Author**: PhD student: Piotr Kanarek, MSc, Eng., supervisor: Barbara Breza-Boruta, PhD, DSc, Eng., prof. PBŚ

**Evidence:**
**Kanarek P.**, Bogiel T., Breza-Boruta B., 2022. Legionellosis Risk—an Overview of *Legionella* spp. Habitats in Europe. Environmental Science and Pollution Research 29:76532–76542. https://doi.org/10.1007/s11356-022-22950-9; 100 ministerial points; IF 2022: 5.8; 14 citations according to Web of Science.
Cited by e.g.: Capuano R., Mansi A., Paba E., Marcelloni A.M., Chiominto A, et al., 2023. A pilot study for *legionella pneumophila* volatilome characterization using a gas sensor array and GC/MS techniques. Sensors 23, 1401. https://doi.org/10.3390/s23031401; Abkar L., Moghaddam H.S., Fowler S.J., 2023. Microbial ecology of drinking water from source to tap. Science of the Total Environment 908, 168077. https://doi.org/10.1016/j.scitotenv.2023.168077

**Description:**
The article is a comprehensive review of reports related to the occurrence of pathogenic bacteria of the genus *Legionella* spp. in Europe. Most often, current research focuses on the existence of these bacteria in anthropogenic systems. With the increase in legionellosis in Europe, the authors highlight the importance of natural watercourses, as well as compost, soil and irrigation systems in the propagation of the pathogen. The publication of the results of the research in a recognized international journal has contributed to the increase in the current state of knowledge about agricultural and environmental microbiology, as well as contributed to a better understanding of threats related to natural and anthropogenic water systems.

**3. Title of the achievement:** Scientific publication

**Author**: PhD student: Rafał Nowak, M.Sc., Eng., supervisor: Prof. Małgorzata Szczepanek, Ph.D., D.Sc., Eng.

**Evidence:**
Nowak R., Szczepanek M., Błaszczyk K., Kobus-Cisowska J., Przybylska-Balcerek A., 2023. Stuper-Szablewska, K.; Poberežny, J.; Hassanpouraghdam, M.B.; Rasouli, F., 2023. Impact of the Farming System and Amino-Acid Biostimulants on the Content of Carotenoids, Fatty Acids, and Polyphenols in Alternative and Common Barley Genotypes. Agronomy 13, 1852.
https://doi.org/10.3390/agronomy13071852; 100 ministerial points; IF 2023: 3.7; 5 citations according to Web of Science.
Quoted by, for example:
Abdelrady W.A., Ma Z., Elshawy E.E., Wang L., Askri S.M.H., et al., 2024. Physiological and biochemical mechanisms of salt tolerance in barley under salinity stress. Plant Stress, 11, 100403. https://doi.org/10.1016/j.stress.2024.100403; Raza Q.U.A., Rehim A., Bashir M.A., Raza H.M.A., Aon M., et al., 2024. Identifying the abilities of biostimulants to improve vegetable production compared with conventional fertilizer. Frontiers in Sustainable Food Systems, 8, 1345259. https://doi.org/10.3389/fsufs.2024.1345259

**Description:**
Importance of achievement in the context of agriculture and horticulture: The results of the study indicate that alternative genotypes of barley have a higher ability to concentrate bioactive health-promoting compounds (lutein, total phenolic acids, flavonoids and anthocyanidins) in grain than the modern barley variety and can be a valuable source of these health-promoting substances, especially if they are organically grown. They also indicate a strong stimulating effect of the application of an amino acid biostimulator on the content of phenolic compounds and carotenoids in barley grains. In addition, the results provide valuable information on agrotechnical ways to increase the functional value of cereal grains. They indicate the high utility value of alternative barley genotypes and the possibilities of its use in cultivation, as well as the prospects for further research on the impact of agrotechnical and environmental factors on the content of bioactive

compounds in alternative barley genotypes, and indicate the role of fatty acids and phenolic compounds in the defense mechanisms of these plants. The results of the research can be used in agricultural practice, which in turn may translate into strengthening the biodiversity of farmlands and the potential of barley production towards functional food.

**4. Title of the achievement:** Participation in an industry forum

**Author:** PhD student: Krystian Ambroziak, MSc, Eng., Supervisor: Prof. Anna Wenda-Piesik, PhD, DSc, Eng.

**Proof:**
A PhD student of the Doctoral School of the Silesian University of Technology and the only speaker from Polish took part in the 'Polish-German Entrepreneurs' Forum "The potential of hemp in the value chain" – 26.09.2024 at the Biookonomiezentrum, Anklam, Germany at the invitation of the German side. He gave a talk on 'Hemp as food and feed'. He conducted a workshop with the presentation and tasting of cannabis edibles, according to the technology he developed in his implementation doctorate. Together with a working team, he developed three postulates for the development of hemp addressed to the German Ministry of Agriculture.

**Description:**
Presenting the results of own research and the progress of development research for the implementation of hemp products as part of the implementation doctorate are the author's achievement on a national and international scale. Hemp is inscribed in the basic agricultural activity and the author has shown a significant contribution to the progressive use of this species as a component of food and feed. The author has taken active action to promote the species and products of true hemp in the arena of the German Ministry of Agriculture, by submitting specific proposals for further development. Related to this issue is the publication: Ambroziak K.., Wenda-Piesik A., Kozera W., 2023. Regulating the plant density influences to the weed infestation, productivity and chemical composition of seeds of true hemp *Cannabis sativa* L. Journal of Elementology, 28(3), 619-631, https://doi.org/10.5601/jelem.2023.28.3.2425; 140 ministerial points; IF 2023: 0.9.

**5. Title of the achievement:** Presentation at the conference

**Author**: PhD student: Piotr Kanarek, MSc, Eng., Supervisor: Barbara Breza-Boruta, PhD, DSc, Eng., prof. PBŚ

**Proof:**
Authors: Kanarek Piotr, Breza-Boruta Barbara, Wiśniewska Wioletta. Title: Comparative analysis of selected bioactive components and abundance of LAB bacteria in selected functional foods.
I National Scientific Conference, "Food and nutrition in a nutshell", Medical University of Gdańsk, Gdańsk 22.04.2023. Featured Speech

**Description:**
The study indicates a higher abundance of lactic acid bacteria and vitamin C in organic products, thus promoting the use of fermentation and organic products in food processing. In addition, the identified health benefits of systematic consumption of functional foods may encourage farmers to develop organic farming. The presented results may be a prelude to more detailed research on increasing the content of bioactive components in fermented agricultural products.

## 5. chemical sciences

Achievement Description

**1. Title of the achievement:** Synthesis and application of new materials used in dispersive solid-phase extraction (dSPE)

**Author:** PhD student Ścigalski Piotr

**Description:**
Selected publications present the subject of solid phase dispersion extraction, showing the potential and flexibility of this sample preparation technique used to separate a wide range of matrices and analytes using a variety of sorbents. The presented research describes the application of this technique in analytical procedures developed to evaluate the ability of the obtained materials to isolate selected organic and inorganic analytes. The review paper presents new analytical methodologies using dSPE that are the most interesting in terms of the sorbent used, showing extremely high values of sensitivity or accuracy, or describing unusual modifications of extraction or measurement techniques. Analyzing this review, it can be concluded that the most popular materials as sorbents are currently carbon-based materials, such as graphene and its derivatives, activated carbon or carbon nanotubes. The article also presents in a unique way the problem of selecting the right material and measurement technique – there is no perfect sorbent or method that can be used in every analysis. From among the available options, it is necessary to choose those that are best suited for the analysis of the analyzed analyze, taking into account the nature of the sample matrix, access to measuring equipment, desired measurement accuracy, etc. The next article (ESPR) presents research conducted in cooperation with the team of Professor Tatiana Tatarchuk from the Faculty of Chemistry of the Vasyl Stefanyk Precarpathian University in Ivano-

Frankivsk, Ukraine. A series of extractions of salicylic acid (SA) from aqueous solutions using a group of zinc and magnesium ferrates with different ratios of zinc and magnesium in the crystal structure, described by the molecular formula Mg1–xZnxFe2O4, is described. These materials, exhibiting magnetic properties, were obtained in the process of spontaneous ignition of the sol-gel system using a mixture of alanine and urea as a fuel. The salicylic acid extraction trials were carried out to evaluate their ability to adsorb ionic organic compounds from aqueous samples. The results of the pre- and post-extraction content obtained by high-performance liquid chromatography (HPLC) with spectrophotometric detection in visible light and ultraviolet (UV/Vis) showed that the adsorption capacity of salicylic acid increased with the increase of the zinc content in the crystal structure. It is worth noting that in the initial stages, the extraction was faster for a material with magnesium and zinc content with a ratio of 3:2 (described by the function x(Zn) = 0.4), allowing for a quick equilibrium state. However, the final sorption capacity of this preparation was the lowest among the substances tested.

**Proof:**
Tatarchuk T.; Naushad M.; Tomaszewska J.; Kosobucki P.; Myslin M.; Vasylyeva H.;
Ścigalski P. Adsorption of Sr(II) ions and salicylic acid onto magnetic magnesiumzinc ferrites: isotherms and kinetic studies, Environmental Science and Pollution
Research, doi: 10.1007/s11356-020-09043-1, IF=4,223, 100 points, number of citations 67.
Ścigalski P.; Kosobucki P. Recent Materials Developed for Dispersive Solid Phase Extraction, Molecules, doi: 10.3390/molecules25214869, IF=4.2, 140 points, number of citations 52.

**2. Title of the achievement:** Spectroscopic, spectroscopic and photophysical properties of six oxazolone dyes

**Author:** PhD student Chorobiński Mateusz

**Description:**
Oxazolones are widely used in various fields of science and industry due to their good thermal and photochemical stability, good solubility and easy synthesis, as well as the relatively uncomplicated ability to regulate their photochemical and photophysical properties. Initially, due to the broad spectrum of pharmacological activity, including anticancer, antibacterial, antifungal, antagonistic, anticancer, sedative, etc., the practical application of oxazolones was focused on medicine, biochemistry and pharmacy. Appropriately designed and substituted oxazolones are used as molecular photoswitches, optical sensors for pH measurement, light-sensitive devices for protein analysis and nonlinear fluorophores. In the above-mentioned applications, the operation of oxazolone-based systems plays a key role in the optical properties (e.g. value of bandgap energy, position of absorption bands) of organic compounds. The paper presents the spectroscopic and photophysical properties of six oxazolone dyes in different environments, i.e. chloroform, solvent mixture, PMMA matrix and in the solid state. The optical properties (e.g., the real part of the complex refractive index, extinction coefficient and absorption coefficient, as well as the bandgap energy) of oxazolone dyes and dyes immobilized in PMMA matrix thin films were determined using spectroscopic ellipsometry (SE). The aim of the work was to show how different substituents introduced into oxazolone molecules affect their spectral and optical properties. These chemical modifications allow to change the optical properties of heterocyclic oxazolone dyes throughout the UV–Vis spectrum.

**Proof:**
Chorobiński M., Śmiałek P., Gordel-Wójcik M., Petrusevich E.F., Zych E., Plażuk D., Skowronski Ł., Jędrzejewska B., Journal of Luminescence, https://doi.org/10.1016/j.jlumin.2022.119584, IF=3.3, 100 points, number of citations: 0

**3. Title of the achievement:** Microstructure and optical properties of nanostructural thin films fabricated through oxidation of Au–Sn intermetallic compounds

**Author:** PhD student Olszewska Aleksandra

**Description:**
Semiconductor nanostructured metal oxides with a large specific surface area with multiple active sites for catalytic reactions can be used in gas sensors, in dye-based photovoltaic cells and as an electrode material in lithium-ion batteries. In these applications, oxides such as CuO, SnO2, ZnO, TiO2, Fe2O3, In2O3, Co3O4 and WO3 in the form of m.in nanorods, nanoparticles, nanospheres, nanotubes are most often used. The challenge in this area is to produce sensors operating at room temperature with appropriate sensitivity and selectivity. One of the methods leading to achieving this goal is the production of multiphase structures or the incorporation of metal ions into the oxide structure. In this study, the process of forming layers of Au-SnOx nanoparticles by thermal oxidation (800oC) of thin layers of AuSn and AuSn2 intermetallic compounds was investigated. The Au:Sn atomic ratio has been shown to be crucial during the formation of Au-SnOx structures. Structures with morphology desirable in catalytic systems (i.e. Au nanoparticles in an oxide matrix) were obtained and characterized

**Proof:**
Skowroński Ł., Trzciński M., Olszewska A., Szczęsny R., Microstructure and optical properties of nanostructural thin films fabricated through oxidation of Au–Sn intermetallic compounds, Materials, https://doi.org/10.3390/ma14144034, IF=3,1, 140
pts., number of citations: 6

**4. Title of the achievement:** Poly(vinyl chloride) composites reinforced with wood flour and calcinated halloysite

**Autor:** PhD student Wieczorek Martina

**Description:**
In this paper, the use of two fillers of different origin and morphology was proposed, one of which was modified by thermal treatment, for the production of composites based on unplasticized poly(vinyl chloride) matrix. The effect of calcined halloysite on the mechanical (dynamic, static, hardness and impact strength) and thermal (thermal stability, Vicat softening point and deflection temperature) properties of composites with 30 wt% was determined. of wood flour. It was found that the mineral filler, by positively influencing the homogeneity of the composite structure assessed on the basis of SEM images, improves their thermal stability. The synergistic effect of wood flour and halloysite is confirmed by the results of tests of mechanical properties, i.e. higher modulus of elasticity by 8% and tensile strength by 14% compared to composite materials containing only wood filler. The simultaneous use of wood flour as a renewable material and halloysite derived from natural resources as fillers in mixtures on the PVC matrix can be an eco-effective solution for the sector of new composite materials with favorable processing and functional properties, in particular thermal and mechanical.

**Proof:**
Wieczorek, M., Tomaszewska, J. (2024). Poly(vinyl chloride) composites reinforced with wood flour and calcinated halloysite. Wood Material Science & Engineering, 20(5), 1002–1017. doi:10.1080/17480272.2024.2380862, IF=2,3, 100 pkt., liczba cytowań: 1

## 6. information and communication technology

Achievement Description

**1. Title of the achievement:** Novel application of queue theory in modeling metabolic processes occurring in biological cells

**Author:** PhD student Krzysztof Pałczyński, MSc, Eng.

**Description:**
The scientific achievement of Krzysztof Pałczyński, MSc, Eng. is the innovative application of the theory of queues in modeling metabolic processes occurring in biological cells. The application of queue theory allows to avoid problems typical of the differential equations used so far. One such problem is the possibility of obtaining a negative value of the concentration of a substance using differential equations. This problem does not occur in the theory of queues. To apply queue theory to biomedical process modelling, proprietary modifications of the genetic algorithm were developed to train cell models using mechanisms from queue theory. Work on this issue was carried out as part of the research project UMO-2019/33/B/ST6/00875 "Telecommunications approach to modeling cell metabolism" awarded under the National Science Centre. Based on the results of the research, five scientific articles were published, in which Krzysztof Pałczyński, MSc, Eng., was a co-author. The published articles are presented in the table below:

**Evidence:**
Authors/Title/ Journal/Number of points/Co. IF/Citation
Sylwester Kloska, Krzysztof Pałczyński, Tomasz Marciniak, Tomasz Talaśka, Marissa Nitz, Beata Wysocka, Paul Davis, Tadeusz Wysocki, *Queueing theory model of Krebs* Cycle,2021, Bioinformatics, 37, 18, 2912-2919, 10.1093/bioinformatics/btab177/ 200/ 6,9/ 16
Sylwester Kloska, Krzysztof Pałczyński, Tomasz Marciniak, Tomasz Talaśka, Marissa Miller, Beata Wysocka, Paul Davis, Tadeusz Wysocki, *Queueing theory model of pentose phosphate pathway*, 2022, Scientific Reports, 12, 1, 10.1038/s41598-022-08463-y/ 140/ 4,9/ 17
Sylwester Kloska, Krzysztof Pałczyński, Tomasz Marciniak, Tomasz Talaśka, Marissa Miller, Beata Wysocka, Paul Davis, Tadeusz Wysocki, *Conversion of fat to cellular fuel-Fatty acids beta-oxidation model,* 2023, Computational Biology and Chemistry, 104, 10.1016/j.compbiolchem.2023.107860/ 70/ 3,7/ 1
Sylwester Kloska, Krzysztof Pałczyński, Tomasz Marciniak, Tomasz Talaśka, Marissa Miller, Beata Wysocka, Paul Davis, Ghada Soliman, Tadeusz Wysocki, *Queueing theory model of mTOR complexes' impact on Akt-mediated adipocytes response to insulin*, PLoS One, 2022, 17, 12, 10.1371/journal.pone.0279573/ 100/ 3,7/ 2/
Sylwester Kloska, Krzysztof Pałczyński, Tomasz Marciniak, Tomasz Talaśka, Beata Wysocka, Paul Davis, Tadeusz Wysocki, *Integrating glycolysis, citric acid cycle, pentose phosphate pathway, and fatty acid beta-oxidation into a single computational model*, Scientific Reports, 2023, 13, 1, 10.1038/s41598-023-41765-3/ 140/ 4,9/ 5

**2. Title of the achievement:** Co-authorship of a chapter in the book "Intelligent and energy-saving water cutting system (SERW)" and presentation of the system at a scientific conference.

**Author:** PhD student Jarosław Drulik

**Description:**
The PhD student co-authored the key chapter of the scientific monograph entitled "Intelligent and energy-efficient water cutting system (SERW)". This paper describes an expert system designed to support water management using advanced artificial intelligence methods. The SERV system is an innovative solution that analyzes data from water networks, optimizes water distribution and detects leaks in real time, contributing to significant resource and energy savings. Expert systems in water management, as described in the monograph, are tools capable of automatically monitoring and managing networks. SERW enables, m.in other things, optimization of pumping station operation, pressure control and flow analysis, which ensures effective water distribution. The system can also identify anomalies and leaks, which significantly reduces losses and repair costs. The project implemented artificial intelligence algorithms that enable data analysis and decision-making based on mathematical models.

**Proof:**
"Intelligent and energy-efficient water cutting system (SERW)", 2024, Warsaw (ISBN: 978-83-60956-71-7, pp. 107 – 121).

**3. Title of the achievement:** Development of an intelligent algorithm for monitoring and managing devices in complex computer networks.

**Author:** PhD student Jarosław Drulik

**Description:**
In the face of dynamically developing computer networks, it is crucial to implement advanced monitoring solutions that ensure high performance, reliability and security. The PhD student has developed an innovative algorithm that automates the process of monitoring and managing devices in complex networks. The algorithm consists of several key components. The algorithm collects performance metrics, network traffic statistics, resource consumption information, and device status using a variety of protocols such as SNMP, CDP, and LLDP. The collected information is processed using advanced artificial intelligence (AI) and machine learning (ML) techniques, allowing for effective pattern detection and optimization of asset management. By analyzing real-time data, the algorithm can identify unusual device behavior, such as performance drops or potential threats. The algorithm can take immediate corrective action, reducing downtime and the risk of major failures, without the need for human intervention. The algorithm is capable of interfacing with a wide range of devices and protocols.
As part of the research, the PhD student used a random forest model, which, thanks to its resistance to overlearning and the ability to handle high-dimensional data, showed high efficiency in classifying devices and identifying anomalies. This algorithm automates data analysis, which is far superior to traditional monitoring methods.

**Proof:**
An example of the algorithm's use case is implementing it in a global technology corporation, where the network connects distributed locations such as offices, data centers, and manufacturing plants. Tests have shown that the algorithm effectively collects and analyzes SNMP data, identifies potential threats, and thanks to integration with the CMDB database, enables precise management of device configuration.

**4. Title of the achievement:**
Searching for effective ontological models and effective machine learning methods and techniques for intelligent knowledge mining in BIG DATA datasets.

**Author:** PhD student Jacek Suty

**Description:**
As part of the implementation work, a methodology for the selection of technical solutions was developed Before the selection of the cloud service provider, a methodology for the selection of technical solutions was developed, in which each perspective is reduced to a point value and calculated according to the applied formulas based on the average. This methodology has been successfully used in commercial projects and public institutions for the transparent selection of a specific technical solution for the project. The results of the selection of technical solutions were verified by solution providers in real selection processes. The methodology was highly rated by them as a transparent approach aggregating and addressing the business, financial, technological and business needs of the contracting authority.
The PhD student conducts research on the use of a unique combination of the dynamically growing needs of heterogeneous data collection environments with the possibilities of using machine learning methods and techniques to optimize the operation of knowledge mining systems. The research hypothesis assumes the possibility of intelligent knowledge mining in BIG DATA data sets without the participation of the "human factor" using automatically built ontological models, semantic networks and machine learning algorithms, in particular classification methods in the field of verification of the rules of belonging and data matching.
A literature review revealed that AI can help build specific ontological models, create intelligent data classification algorithms, as well as automatic data acquisition and verification processes. A bibliography list of over 60 items was

compiled. The content of each publication has been analyzed in the context of the construction of domain ontologies and the way large data sets are organized. PhD student He carried out work consisting in the development of a transparent structure of object categories for separate product groups. The number of ontologies created was identified and the selection of appropriate types of serialization for the above-mentioned products was made. Analytical work related to the grouping of the separated products was carried out. In the process of building these structures, criteria such as coherence, extensibility, evaluation and minimum involvement were used. The work was based on a logical categorization model that uses set theory, allowing for semi-automatic conversion to a class structure in an ontological model. As a result of the work, a complete categorization of objects within the created ontologies was developed.

**Proof:**
- 5th Polish Conference on Artificial Intelligence (PP-RAI 2024) organized by the Warsaw University of Technology and the Polish Association of Artificial Intelligence, presenting a poster speech entitled "Innovative Distributed Transaction System for Agricutural Products".
- XVI National Interdisciplinary Scientific Conference "Tygiel "Interdisciplinarity as the key to success". The PhD student presented his thesis in the form of an oral presentation entitled "A system of commercial transactions for agricultural products, based on a dedicated metadata standard, blockchain technology and methods and techniques of computational intelligence".
- Currently, as part of the research work, the ontologies developed are being prepared for publication as part of the project: http://knowledgeweb.semanticweb.org/. Publication is planned for the first quarter of 2025

## 7. management and quality studies

Achievement Description

The discipline does not show the achievements of doctoral students due to the short period of education. The first candidate was recruited in the 2024/2025 academic year, i.e. from October 1, 2024, and submitted an Individual Research Plan on September 23, 2025. The second doctoral student was admitted in the 2025/2026 academic year and has 12 months from the start of their education to submit their Individual Research Plan.

## 8. animal science and fisheries

Achievement Description

**1. Title of the achievement:** Mechanisms of communication between the microbiota of the gastrointestinal tract and the host organism in broiler chickens

**Author:** PhD student Aleksandra Bełdowska

**Description:**
The presented scientific publications and conference presentations are of significant importance for the discipline of zootechnics and fisheries. These studies provide important information on the impact of various interventions (in ovo stimulation) in the embryonic stage and early life of poultry on health, gut development, metabolic function, and gene and microbiome regulation. They make it possible to develop more effective strategies for managing the health and performance of birds, which can lead to improved bird welfare, better product quality and increased production efficiency. In addition, understanding mechanisms such as interactions between the gut microbiome and the liver and the effects of probiotics on mitochondria is important for the development of innovative prevention and therapies in poultry farming.

**Evidence:**
*1. Scientific publications:*
a. Pre-hatching and post-hatching environmental factors related to epigenetic mechanisms in poultry, Dunislawska, A., Pietrzak, E., Wishna Kadawarage, R., Beldowska, A., Siwek, M.IF : 3,3, Journal of Animal Science
b. Response in liver gene expression and DNA methylation to changes in the intestinal microbial profile after in ovo stimulation of chickens, Dunisławska, A., Pietrzak, E., Bełdowska, A., Sławińska, A. Siwek, M, IF: 1,4, Journal of Animal and Feed Sciences
c. Health in poultry- immunity and microbiome with regard to a concept of one health - Many Faces of Poultry Science, Dunislawska, A., Pietrzak, E., Beldowska, A., Siwek, M., Chapter in DeGruyter book
d. State of the art in research on the gut-liver and gut-brain axis in poultry, Bełdowska A., Barszcz M., Dunisławska A., IF: 7,0, Journal of Animal Science and Biotechnology
e. Effect of prebiotics administered during embryo development on mitochondria in intestinal and immune tissues of adult broiler chickens, Dunisławska A., Bełdowska A., Yatsenko O., Siwek M., IF: 4,4, Poultry Science
f. The effect of sodium butyrate administered in ovo on the health status and intestinal response in broiler chicken, Bełdowska A., Pietrzak E., Biesek J., Barszcz M., Tuśnio A., Konopka A., Gawin K., Dunisławska A., IF: 3.8, Poultry Science
g. Impact of in ovo administration of xylo- and mannooligosaccharides on broiler chicken gut health, Bełdowska A., Siwek M., Biesek J., Barszcz M., Tuśnio A., Gawin K., Dunisławska A., IF: 3.8, Poultry Science

*2. Presentations at conferences:*

a. International PhD Student Conference, Research and Innovation in Agricultural, Livestock and Food Science", Changes in hepatic gene expression and methylation upon in ovo modulation of the intestinal microbiota with bioactive substance in chickens
b. Proceedings of the EcoSET Closing Conference, Multispecies probiotic supplementation evokes hepatic gene expression changes in pigs, ISBN 978-83-66530-58-4
c. VI. International Congress on Domestic Animal Breeding, Genetics and Husbandry, In ovo stimulation with bioactive substances causes changes in gene expression and methylation of caecal tonsils in chickens,
d. Proceedings of the ICABGEH-23, Effect of in ovo stimulation with XOS and MOS prebiotics on gut microbiota and gene expression in intestinal mucosa, ISBN 978-605-06447-3-9
e. 75th Annual Meeting of the European Federation of Animal Science, Changes in gene expression and DNA methylation in the liver of broiler chickens after in ovo stimulation with sodium butyrate, ISBN 979-12-210-6769-9
f. 75th Annual Meeting of the European Federation of Animal Science, Title: Changes in brain gene expression after in ovo stimulation by sodium butyrate during embryo development of chicken, ISBN 979-12-210-6769-9

**2. Title of the achievement:** Profibiotic – a new bioactive substance for early embryonic stimulation of the microflora of the gastrointestinal tract

**Author:** PhD student Ramesh N. Wishna Kadawarage

**Description:**
The research carried out by Ramesh N. Wishn Kadawarage concerned the use of a probiotic and the combination of a probiotic with a plant extract in the early embryonic stimulation of the gastrointestinal microflora based on in ovo technology. The greatest achievement of the PhD student is the development, promotion and validation in vivo of a "profibiotic" - a combination of *Leuconostoc mesenteroides* bacteria and aqueous garlic extract. The PhD student conducted a series of *in vitro experiments* involving the characterization of the growth of selected strains of probiotic bacteria in the presence of plant extracts. The next stage involved the selection of a strain of probiotic bacteria with strong antipathogenic properties. The last stage of the research carried out as part of the doctoral dissertation is the in vivo validation of the effect of a profibiotic administered on the 12th day of embryonic development into the air chamber of the egg of broiler chickens on intestinal health and production parameters of chickens during rearing

**Evidence:**
*1. Scientific publications:*
a. MicroRNA expression in immune tissues of adult chickens after embryo stimulation with bioactive substances. Journal: Scientific Reports (IF = 3.8), Dunislawska A, Pietrzak E, Wishna-Kadawarage R, and Siwek M.
b. Ecological footprint of poultry production and effect of environment on poultry genes. Book: Poultry Science (Walter de Gruyter GmbH) Journal: Physical Sciences Reviews Authors: Wishna-Kadawarage R, Dunislawska A, and Siwek M.
c. Pre-hatching and post-hatching environmental factors related to epigenetic mechanisms in poultry Journal: Journal of Animal Science (IF = 3.8), Dunislawska A, Pietrzak E, Wishna-Kadawarage R, Beldowska A, and Siwek M.
d. Modulation of gene expression in immune-related organs by in ovo stimulation with probiotics and prophybiotics in broiler chickens, Journal of Applied Genetics Impact factor: 2.0 (2023)
e. Prophybiotics for in-ovo stimulation; validation of effects on gut health and production of broiler chickens, Poultry Science Impact factor: 3.8 (2023) Published date: 16.02.2024, ttps://doi.org/10.1016/j.psj.2024.103512
f. In-vitro selection of lactic acid bacteria to combat Salmonella enterica and Campylobacter jejuni in broiler chickens Journal: World Journal of Microbiology and Biotechnology 40, 133, https://doi.org/10.1007/s11274-024-03946-8 Impact factor: 4.0 (2023), Published date: 14.03.2024.
g. In-vitro screening of compatible synbiotics and (introducing) "prophybiotics" as a tool to improve gut health Journal: International Microbiology 27, 645–657, https://doi.org/10.1007/s10123-023-00417-2 Impact factor: 2.3 (2023) Published date: 22.08.2023.

*2. Presentations at conferences:*
a. Annual Meeting EAAP 2023 – title of the speech in point 5, In-vitro screening of lactic acid bacteria for their ability to inhibit Salmonella species in broiler chickens
b. Conference: 7th International Congress on Domestic Animal Breeding Genetics and Husbandry, Krakow, "Prophybiotics" for controlling the Salmonella infection in broiler chickens
c. Conference: Baltic University Program Symposium 2023, In-vitro selection of compatible synbiotics and (introducing) "prophybiotics" as a tool to improve gut health in chickens.
d. Conference: Baltic University Program Symposium 2022, In-vitro selection of compatible synbiotics and (introducing) "prophybiotics" as a tool to improve gut health in chickens.
e. Conference: 6th International Congress on Domestic Animal Breeding Genetics and Husbandry, Samsung

*3. Research grants:*
a. PhD student, ESR (Early Stage Researcher) in the MonoGutHealth project funded by the European Commission (Marie Skłodowska-Curie grant agreement 955374)

*4. Conference Scholarships:*
a. EAAP Annual Meeting 2023 in Lyon Awarded EAAP scholarship for meeting attendance, speech title: Prophybiotics, a novel approach for in-ovo gut microbiome reprogramming of broilers

**3. Title of the achievement:** An innovative method to mitigate the effects of Campylobacter jejuni infection in broiler chickens.

**Author:** PhD student Ramesh N. Wishna Kadawarage

**Description:**
The research carried out by Ramesh N. Wishn Kadawarage concerned the use of the probiotic *Leuconostoc mesenteroides* and a profibiotic: a combination of *Leuconostoc mesenteroides bacteria* and an aqueous garlic extract during a single application at the hatchery level. The PhD student's achievement is to demonstrate that a single application of a probiotic or profibiotic significantly reduces the colonization of *Campylobacter jejuni* during the rearing period of broiler chickens. Reducing *Campylobacter jejuni* battery colonization did not require the use of any additional supplements. In the opinion of the PhD student, this method may be useful for the broiler industry, providing a low-cost but promising solution for controlling *Campylobacter jejuni* contamination in products obtained from broiler chickens.

**Evidence:**
*1. Scientific publications:*
Method: Protocol for in-ovo stimulation with selected pro-/prophy-biotics to mitigate Campylobacter jejuni in broiler chickens. Animal Open Space, Volume 3, December 2024, 100077. Ramesha N. Wishna Kadawarage, Rita M. Hickey, Maria Siwek

*2. Presentations at conferences:*
European Poultry Conference EPC 2024 – scholarship for meeting attendance, title of the speech: "Probiotics or prophybiotics? Validation of effects of in ovo administration on gut health and production of broiler chickens."

*3. Research grants:*
PhD student, ESR (Early Stage Researcher) in the MonoGutHealth project funded by the European Commission (Marie Skłodowska-Curie grant agreement 955374)

*4. Awards and distinctions:*
European Poultry Conference EPC 2024 – scholarship for meeting attendance, title of the speech: "Probiotics or prophybiotics? Validation of effects of in ovo administration on gut health and production of broiler chickens."

# ATTACHMENTS

**Adequacy of the education program and individual research plans to the learning outcomes for qualifications at PRK level 8 and their implementation**

| No. | File type | Filename |
|---|---|---|
| 1 | Education programmes during the evaluation period | Szkoła_Doktorska_UTP_EN.pdf |
| 2 | Education programmes during the evaluation period | Szkoła_Doktorska_PBŚ_-_program_nr_II_EN.pdf |
| 3 | Education programmes during the evaluation period | Szkoła_Doktorska_PBŚ_-_program_nr_II_-_zmiana_I_EN.pdf |
| 4 | Education programmes during the evaluation period | Szkoła_Doktorska_PBŚ_-_program_nr_II_-_zmiana_II_EN.pdf |
| 5 | Education programmes during the evaluation period | Szkoła_Doktorska_PBŚ_-_program_nr_II_-_zmiana_III_EN.pdf |

## Method of verifying learning outcomes for qualifications at PRK level 8

| No. | File type | Filename |
|---|---|---|
| 1 | The method of assessing the learning outcomes for qualifications at level 8 of the PQF | Sylabusy_EN.pdf |
| 2 | The method of assessing the learning outcomes for qualifications at level 8 of the PQF | Procedury_WSZJK_EN.pdf |
| 3 | The method of assessing the learning outcomes for qualifications at level 8 of the PQF | Procedury_SzD_EN.pdf |
| 4 | The method of assessing the learning outcomes for qualifications at level 8 of the PQF | Raporty_jakości_EN.pdf |

## Qualifications of academic teachers or research staff conducting education at the doctoral school

| No. | File type | Filename |
|---|---|---|
| 1 | information and communication technology | 1._ITiT_-_EN.pdf |
| 2 | chemical engineering | 2._IC_-_EN.pdf |
| 3 | mechanical engineering | 3._IM_-_EN.pdf |
| 4 | civil engineering, geodesy and transport | 4._ILGiT_-_EN.pdf |
| 5 | agriculture and horticulture | 5._RiO_-_EN.pdf |
| 6 | animal science and fisheries | 6._ZiR_-_EN.pdf |
| 7 | management and quality studies | 7._NZiJ_-_EN.pdf |
| 8 | chemical sciences | 8._NC_i_Kształcenie_ogólne_-_EN.pdf |

## Quality of the recruitment process

| No. | File type | Filename |
|---|---|---|
| 1 | The compositions of the admissions committees during the evaluation period and the rationale for their selection with the aim of maintaining high admission standards | Składy_komisji_rekrutacyjnych_EN.pdf |
| 2 | The regulations of the doctoral school during the evaluation period | Regulamin_Szkoły_doktorskiej_PBŚ_EN.pdf |
| 3 | The admissions rules of the doctoral school during the evaluation period | Zasady_rekrutacji_EN.pdf |

## Quality of scientific or artistic supervision and support for conducting scientific activities

| No. | File type | Filename |
|---|---|---|
| 1 | Internal regulations that pertain to the midterm evaluation and that are in force during the evaluation period, such as evaluation rules and criteria | 1._Powołania_i_uchwały_EN.pdf |
| 2 | Internal regulations that pertain to the midterm evaluation and that are in force during the evaluation period, such as evaluation rules and criteria | 2._Wyciąg_z_regulaminu_EN.pdf |
| 3 | Internal regulations that pertain to the midterm evaluation and that are in force during the evaluation period, such as evaluation rules and criteria | 3._Materiały_szkoleniowe_EN.pdf |

# STATEMENTS

- [ ] I hereby declare that the information contained in the self-assessment report is fully consistent with the factual and legal status.
- [ ] I hereby declare that the information contained in the self-assessment report in Polish and English is fully identical in substance.
- [ ] I hereby declare that the documents attached to the self-assessment report in Polish and English are fully identical in substance.

Signature

# AUTHORIZATIONS

**Added files**

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# CRITERION

# 1. Adequacy of the curriculum and individual research plans to the learning outcomes for qualifications at level 8 of the PRK and their implementation

## Curriculum

## UTP Doctoral School

# Resolution No. 10/428 of the Senate of the UTP University of Science and Technology in Bydgoszcz of 22 May 2019

concerning: establishing the curriculum for the Doctoral School starting from the academic year 20 1 9/2020

Based on:

- Article 291 of the Act of 3 July 2018 on the introduction of the Law on Higher Education and Science (Journal of Laws of 201 8, item 1669), _ Article 201(4) of the Act of 20 July 2018 on Higher Education and Science (Journal of Laws of 2018, item 1668, as amended),

- Regulation of the Minister of Science and Higher Education of 20 September 2018 on fields of science and scientific disciplines and artistic disciplines (Journal of Laws of 2018, item 1818),

Senate of the UTP University of Science and Technology in Bydgoszcz resolves as follows:

1. The curriculum for the Doctoral School is established in the field of the following scientific disciplines:
    1. information and communication technology,
    2. mechanical engineering,
    3. chemical sciences,
    4. agriculture and horticulture,
    5. animal science and fisheries,
    constituting Annex No. 1,

2. The curriculum referred to in paragraph 1 shall be in force starting from the cycle of education starting from the academic year 2019/2020.
3. The resolution enters into force on the day of its adoption.

**Przewodniczący Senatu**
**Rektor**
**dr hab. inż. Tomasz Topoliński**

Prof. Dr Hab. Inż. Tomasz Topoliński

Plan kształcenia nr 1 / Study plan no. 1

Szkoła Doktorska
nauk inżynieryjno-technicznych i rolniczych
Uniwersytet Technologiczno-Przyrodniczy
im. J.J. Śniadeckich
w Bydgoszczy

| pozycja | przedmiot / subjects | godzin / hours | liczba godzin w semestrze / hours per semester | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | semestr / semester | | | | | | | | | | | | | | | |
| | | | I | | II | | III | | IV | | V | | VI | | VII | | VIII | |
| | | | w | l/s | w | l/s | w | l/s | w | l/s | w | l/s | w | l/s | w | l/s | w | l/s |
| 1 | Metodologia i planowanie badań / Research Methodology and Planning | 60 | **30** | | **30** | | | | | | | | | | | | | |
| 2 | Filozofia poznania / Philosophy of Cognition | 15 | 15 | | | | | | | | | | | | | | | |
| 3 | Retoryka / Rhetoric | 15 | 15 | | | | | | | | | | | | | | | |
| 4 | Metody numeryczne / Numerical Methods | 15 | 15 | | | | | | | | | | | | | | | |
| 5 | Angielski w nauce / English Language in Science | 60 | | 15 | | 15 | | 15 | | 15 | | | | | | | | |
| 6 | Niezbędnik grantowy / Essential Information on Grants | 15 | | | 15 | | | | | | | | | | | | | |
| 7 | Analiza danych - statystyka, wizualizacja danych / Data Analysis - Statistics, Data Visualization | 45 | | | | **15** | | **30** | | | | | | | | | | |
| 8 | Przygotowanie artykułów i prezentacji naukowych / Preparation of Articles and Scientific Presentations | 30 | | | | | 15 | | 15 | | | | | | | | | |
| 9 | Współczesne trendy w rozwoju nauki / Contemporary Trends in Scientific Development | 60 | | | | | | 15 | | 15 | | 15 | | 15 | | | | |
| 10 | Przedsiębiorczość akademicka / Academic Enterpreneurship | 30 | | | | | | | 15 | | 15 | | | | | | | |
| 11 | Inwentyka / Invention Techniques | 15 | | | | | | | 15 | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 | Etyka w nauce / Ethics in Science | 15 | | | | | | | | | | | 15 | | | | | | | |
| 13 | Kurs pedagogiczny / Teaching Module | 90 | | | | | | | | | **30** | | **30** | | **15** | | **15** | | | |
| 14 | Praktyka zawodowa / Internship | 60 | | | | | | | | | | | | | | 30 | | 30 | | |
| 15 | Seminarium doktoranckie / Dissertation Workshop | 150 | | 15 | | 15 | | 15 | | 15 | | 15 | | 15 | | 30 | | 30 | | |
| | godzin razem / hours in semester: | 675 | 105 | | 90 | | 90 | | 90 | | 75 | | 75 | | 75 | | 75 | | | |

Uwagi: Obowiązuje od roku akademickiego 2019/2020

| | |
|---|---|
| # | - przedmiot realizowany oddzielnie w dyscyplinie lub grupie dyscyplin / subjects run separetly in groups of technical and natural science disciplines |
| w | - wykład |
| l/s | - laboratorium lub seminarium / lecture or seminar |

| Numer i opis efektów uczenia się [Number and description of learning outcomes] | | Liczba przemiotów pokrywających efekt uczenia się [Number of subjects covering the learning outcome] | Numer i nazwa przedmiotu [Subject number and name] | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| | | | Metodologia i planowanie badań [Research Methodology and Planning] | Filozofia poznania [Philosophy of Cognition] | Retoryka [Rhetoric] | Metody numeryczne [Numerical Methods] | Angielski w nauce [English Language in Science] | Niezbędnik grantowy [ Essential Information on Grants] | Analiza danych [Data Analysis - Statistics, Data Visualization] | Przygotowanie artykułów i prezentacji naukowych [Preparation of Articles and Scientific Presentations] | Współczesne trendy w rozwoju dyscypliny [Contemporary Trends in | Przedsiębiorczość akademicka [ Academic Enterpreneurship] | Inwentyka [Invention Techniques] | Etyka w nauce [Ethics in Science] | Kurs pedagogiczny [Teaching Module] | Praktyka zawodowa [Internship] | Seminarium doktoranckie [Dissertation Workshop] |
| | | | Liczba pokrytych efektów uczenia się [Number of learning outcomes covered] | | | | | | | | | | | | | | |
| | | | 4 | 6 | 4 | 4 | 2 | 6 | 2 | 7 | 7 | 7 | 4 | 6 | 4 | 3 | 11 |
| **WIEDZA: zna i rozumie [KNOWLAGE: knows and understands]** | | | | | | | | | | | | | | | | | |
| P8S_WG: Zakres i głębia – kompletność perspektywy poznawczej i zależności [Depth and scope - completeness of the cognitive perspective and dependencies] | | | | | | | | | | | | | | | | | |
| a) w stopniu umożliwiającym rewizję istniejących paradygmatów – światowy dorobek, obejmujący podstawy teoretyczne oraz zagadnienia ogólne i wybrane zagadnienia szczegółowe – właściwe dla danej dyscypliny naukowej lub artystycznej | [a) the world's achievements relating to: theoretical foundations, general and selected specific issues of the academic or artistic discipline at a level enabling the revision of existing paradigms] | 3 | ✓ | ✓ | | | | | | | ✓ | | | | | | |
| b) główne tendencje rozwojowe dyscyplin naukowych lub artystycznych, w których odbywa się kształcenie | [b) the main scientific developments in the academic or artistic disciplines essential to the study | 2 | | | | | | | | | ✓ | | | | | | ✓ |
| c) metodologię badań naukowych | [c) the methodology of scientific research] | 5 | ✓ | ✓ | | ✓ | | ✓ | | ✓ | | | | | | | |
| d) zasady upowszechniania wyników działalności naukowej, także w trybie otwartego dostępu | [d) principles of dissemination of the results of scientific activities, also in the open access mode] | 4 | | | | | | ✓ | | ✓ | | ✓ | | | | | ✓ |
| P8S_WK: Kontekst – uwarunkowania, skutki [Context - conditions, effects] | | | | | | | | | | | | | | | | | |
| a) fundamentalne dylematy współczesnej cywilizacji | [a) the fundamental dilemmas of modern civilization] | 2 | | ✓ | | | | | | | ✓ | | | | | | |
| b) ekonomiczne, prawne, etyczne i inne istotne uwarunkowania działalności naukowej | [b) the economic, legal and other essential conditions of conducting scientific research] | 3 | | ✓ | | | | | | | ✓ | | | ✓ | | | |
| c) podstawowe zasady transferu wiedzy do sfery gospodarczej i społecznej oraz komercjalizacji wyników działalności naukowej i know-how związanego z tymi wynikami | [c) basic principles of knowledge transfer to the economic and social spheres and commercialization of the results of scientific activities and know-how related to these results | 4 | | | | | | ✓ | | | | ✓ | ✓ | | ✓ | | |
| **UMIEJĘTNOŚCI: potrafi [SKILLS: is able to]** | | | | | | | | | | | | | | | | | |
| P8S_UW: Wykorzystanie wiedzy – rozwiązywane problemy i wykonywane zadania [Using knowledge - solving problems and carrying out tasks] | | | | | | | | | | | | | | | | | |
| a) wykorzystywać wiedzę z różnych dziedzin nauki lub dziedziny sztuki do twórczego identyfikowania, formułowania i innowacyjnego rozwiązywania złożonych problemów lub wykonywania zadań o charakterze badawczym, a w szczególności: definiować cel i przedmiot badań naukowych, formułować hipotezę badawczą, rozwijać metody, techniki i narzędzia badawcze oraz twórczo je stosować, wnioskować na podstawie wyników badań naukowych | [a) take advantage of knowledge from different academic or artistic fields to creatively identify, formulate and innovatively solve complex problems or perform research activities, especially: to define the aim and subject of the research, formulate a research hypothesis, develop research methods, techniques and tools and use them creatively, draw conclusions on the basis of research results | 6 | ✓ | | | ✓ | | ✓ | ✓ | ✓ | | | ✓ | | | | |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| b) dokonywać krytycznej analizy i oceny wyników badań naukowych, działalności eksperckiej i innych prac o charakterze twórczym oraz ich wkładu w rozwój wiedzy | [b) critically analyze and evaluate the results of scientific research, expert activity and other creative work and their contribution to the development of knowledge] | 4 | ✓ | | | ✓ | | | ✓ | ✓ | | | | | | | | |
| c) transferować wyniki działalności naukowej do sfery gospodarczej i społecznej | [c) transfer the results of research studies to the economic and social spheres] | 3 | | | | | | ✓ | | | | ✓ | ✓ | | | | | |
| P8S_UK: Komunikowanie się – odbieranie i tworzenie wypowiedzi, upowszechnianie wiedzy w środowisku naukowym i posługiwanie się językiem obcym [Communication - understanding and formulating statements, disseminating knowledge in the academic community and using a foregin language] | | | | | | | | | | | | | | | | | | |
| a) komunikować się na tematy specjalistyczne w stopniu umożliwiającym aktywne uczestnictwo w międzynarodowym środowisku naukowym | [a) communicate on specialist topics to the extent that enables active participation in the international scientific community] | 3 | | | | ✓ | | ✓ | | | | | | | | | | ✓ |
| b) upowszechniać wyniki działalności naukowej, także w formach popularnych | [b) disseminate research results, also to the general public] | 3 | | | | ✓ | | | | ✓ | | ✓ | | | | | | |
| c) inicjować debatę | [c) initiate debates] | 4 | | | | ✓ | | | | | ✓ | | | | | | ✓ | ✓ |
| d) uczestniczyć w dyskursie naukowym | [d) participate in academic discourse] | 2 | | | | ✓ | | | | | | | | | | | | ✓ |
| e) posługiwać się językiem obcym na poziomie B2 Europejskiego Systemu Opisu Kształcenia Językowego w stopniu umożliwiającym uczestnictwo w międzynarodowym środowisku naukowymi zawodowym | [e) speak a foreign language at level B2 of the Common European Framework of Reference for Languages (CEFR) to an extent enabling participation in an international professional scientific environment] | 1 | | | | | ✓ | | | | | | | | | | | |
| P8S_UO: Organizacja pracy – planowanie i praca zespołowa [Organising work - planning and team work] | | | | | | | | | | | | | | | | | | |
| a) planować i realizować indywidualne i zespołowe przedsięwzięcia badawcze lub twórcze, także w środowisku międzynarodowym | [a) plan and implement one's own and a team's research or creative work, also in the international community] | 3 | | | | | | ✓ | | | | ✓ | | | | | ✓ | |
| P8S_UU: Uczenie się – planowanie własnego rozwoju i rozwoju innych osób [Learning - planning personal development and development of others] | | | | | | | | | | | | | | | | | | |
| a) samodzielnie planować i działać na rzecz własnego rozwoju oraz inspirować i organizować rozwój innych osób | [a) autonomously plan and act to achieve personal development and inspire and organise the development of others] | 4 | | | | | | | | | | ✓ | | ✓ | ✓ | | | ✓ |
| b) planować zajęcia lub grupy zajęć i realizować je z wykorzystaniem nowoczesnych metod i narzędzi | [b) develop an education or training programme and implement it using modern methods and tools] | 3 | | | | | | | | | | | | | ✓ | ✓ | | ✓ |
| **KOMPETENCJE SPOŁECZNE: jest gotów do [SOCIAL COMPETENCE: is ready to]** | | | | | | | | | | | | | | | | | | |
| P8S_KK: Oceny – krytyczne podejście [Evaluation - critical approach] | | | | | | | | | | | | | | | | | | |
| a) krytycznej oceny dorobku w ramach danej dyscypliny naukowej lub artystycznej | [a) critically evaluate the achievements of one's academic discipline] | 3 | | ✓ | | | | | | | ✓ | | | | | | | ✓ |
| b) krytycznej oceny własnego wkładu w rozwój danej dyscypliny naukowej lub artystycznej | [b) critically evaluate one's contributions to the development of that field] | 3 | | | | | | | | ✓ | ✓ | | | | | | | ✓ |
| c) uznawania znaczenia wiedzy w rozwiązywaniu problemów poznawczych i praktycznych | [c) recognize the value of knowledge in solving cognitive and practical problems] | 4 | | ✓ | | ✓ | | | | | | | | | ✓ | | | ✓ |
| P8S_KO: Odpowiedzialność – wypełnianie zobowiązań społecznych i działanie na rzecz interesu publicznego [Responsibility - fulfillin social obligations and acting in the public interest] | | | | | | | | | | | | | | | | | | |
| a) wypełniania zobowiązań społecznych badaczy i twórców | [a) fulfil the social obligations of researchers and artists] | 1 | | | | | | | | | | | | ✓ | | | | |
| b) inicjowania działań na rzecz interesu publicznego | [b) initiate activities on behalf of the public interest] | 1 | | | | | | | | | | | | ✓ | | | | |
| c) myślenia i działania w sposób przedsiębiorczy | [c) think and act in an enterprising manner] | 2 | | | | | | | | | | ✓ | | ✓ | | | | |

| P8S_KR: Rola zawodowa – niezależność i rozwój etosu<br>[Professional role - autonomy and development of an ethos] | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a) podtrzymywania i rozwijania etosu środowisk badawczych i twórczych, w tym: prowadzenia działalności naukowej w sposób niezależny, respektowania zasady publicznej własności wyników działalności naukowej, z uwzględnieniem zasad ochrony własności intelektualnej | [a) uphold and develop the ethos of the research and artistic communities,<br>including: conducting research in an independent manner, respecting the principle of the public ownership of academic research<br>results, taking into account intellectual property | 4 | | | | | | | | ✓ | | | ✓ | ✓ | | | ✓ | | |

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# CRITERION 1

## Adequacy of the curriculum and individual research plans to the learning outcomes for qualifications at level 8 of the PRK and their implementation

**Curriculum**

**PBŚ Doctoral School**
**Programme No. II**

POLITECHNIKA
BYDGOSKA
im. Jana i Jędrzeja Śniadeckich

# Resolution No. 7/467
## Senate
## Bydgoszcz University of Science and Technology
of 19 January 2022

**on the establishment of the Training Programme No. 2 for the Doctoral School of the Bydgoszcz University of Science and Technology**

Based on:

- § 173 section 2 of the Statute of the Bydgoszcz University of Science and Technology (i.e. introduced by Resolution No. 1/460 of the Senate of the Bydgoszcz University of Technology of 14.07.2021) in connection with Article 201(4) of the Act of 20.07.2018 – Law on Higher Education and Science (Journal of Laws of 2021, item 478, as amended);
- positive opinion of the Council of the Doctoral School of the Bydgoszcz University of Science and Technology expressed in Resolution No. 5/2021 of 10.01.2022.
- positive opinion of the University Council of Doctoral Students' Self-Government of 04.01.2022

*Senate*
*Bydgoszcz University of Science and Technology*
*resolves as follows:*

**§ 1**

1. Establishes the Training Programme No. 2 for the Doctoral School of the Bydgoszcz University of Science and Technology, which is attached to this resolution.
2. Training Programme No. 2 has been in force since the 2022/2023 academic year.

**§ 2**

The resolution enters into force on the day of its adoption.

President of the Senate
Rector

Prof. Marek ADAMSKI

Szkoła Doktorska
Politechnika Bydgoska
im. Jana i Jędrzeja Śniadeckich
[PBS Doctoral School]

# Plan kształcenia nr 2

obowiązuje od roku akademickiego 2022/2023
[from the academic year 2022/2023]

| poz. [no.] | nazwa przedmiotu [subjects] | godzin [hours] | semestr [semester] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | I | II | III | IV | V | VI | VII | VIII |
| 1 | Metodologia i planowanie badań [Research Methodology and Planning] | 45 | 15 | 30 | | | | | | |
| 2 | Metody numeryczne [Numerical Methods] | 15 | 15 | | | | | | | |
| 3 | Retoryka [Rethoric] | 15 | 15 | | | | | | | |
| 4 | Angielski w nauce [English Language in Science] | 60 | 15 | 15 | 15 | 15 | | | | |
| 5 | Niezbędnik grantowy [Essential Information on Grants] | 15 | | 15 | | | | | | |
| 6 | Współczesne trendy w rozwoju nauki [Contemporary Trends in Scientific Development] | 60 | | 15 | 15 | 15 | 15 | | | |
| 7 | Przygotowanie artykułów i prezentacji naukowych [Preparation of Articles and Scientific Presentations] | 30 | | | 15 | 15 | | | | |
| 8 | Analiza danych - statystyka, wizualizacja danych [Data Analysis - Statistics, Data Visualisation] | 45 | | | 15 | 30 | | | | |
| 9 | Filozofia poznania [Philosophy of Cognition] | 10 | | | | | 10 | | | |
| 10 | Etyka w nauce [Ethics in Science] | 5 | | | | | 5 | | | |
| 11 | Blok przedmiotów ogólnych do wyboru [Block of general subjects to choose from]* | 30 | | | | | 30 | | | |
| 12 | Blok przedmiotów z dyscypliny do wyboru [Block of subjects from the discipline to choose from]* | 60 | | | | | | 60 | | |
| 13 | Przedsiębiorczość akademicka [Academic Entrepreneurship] | 15 | | | | | | | 15 | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 14 | Praktyka zawodowa [Internship] | 60 | | | | | | | 30 | 30 |
| 15 | Seminarium doktoranckie [Dissertation Workshop] | 120 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| | razem godzin: | 585 | 75 | 90 | 75 | 90 | 75 | 75 | 60 | 45 |
| | | | liczba godzin w semestrze [hours per semester] | | | | | | | |

Uwagi [Comments]:

# - przedmiot realizowany oddzielnie w grupie dyscyplin [subjects run separately in groups of technical and natural science disciplines]

**# - egzamin [exam]**

* - dodatkowe listy przedmiotów [additional subjects lists]

| 11 | Blok przedmiotów ogólnych do wyboru | Godzin |
|---|---|---|
| i | Badania i rozwój w przedsiębiorstwach [Research and development in enterprises] | 15 h |
| ii | Dydaktyka szkoły wyższej z elementami metodyki [Higher school didactics with elements of methodology] | 15 h |
| iii | Influencer marketing [Influencer marketing] | 15 h |
| iv | Umiejętności miękkie w praktyce [Soft skills in practice] | 15 h |
| v | Własna firma czy praca w korporacji – co lepsze? [Own business or work in a corporation – which is better?] | 15 h |
| vi | Inwentyka [Invention Techniques] | 15 h |

| 12 | Blok przedmiotów do wyboru z dyscypliny inżynieria mechaniczna [Block of elective subjects from the discipline of mechanical engineering] | Godzin [hours] |
|---|---|---|
| i | Cykl życia maszyn i procesów [Machine and process life cycle] | 15 h |
| ii | Inżynieria w ujęciu systemowym [Engineering from a systems perspective] | 15 h |
| iii | Materiałoznastwo [Materials science] | 15 h |
| iv | Mechanika analityczna [Analytical mechanics] | 15 h |
| v | Metoda elementów skończonych [Finite Element Method] | 15 h |
| vi | Metrologia [Metrology] | 15 h |
| vii | Teoria sprężystości i plastyczności [Theory of elasticity and plasticity] | 15 h |

| 12 | Blok przedmiotów do wyboru z dyscypliny nauki chemiczne [Block of elective subjects from the discipline of chemical sciences] | Godzin [hours] |
|---|---|---|
| i | Termodynamika techniczna [Technical thermodynamics] | 30 h |
| ii | NANO -fizyka, informatyka, technologia [Hot topics in modern physics] | 15 h |
| iii | Nanokompozyty polimerowe [Polymer nanocomposites] | 15 h |
| iv | Nowoczesne techniki analizy jakościowej i ilościowej w chromatografii gazowej [Modern techniques of qualitative and quantitative analysis in gas chromatography] | 30 h |
| v | Nowoczesne techniki łączone w chemii analitycznej [Modern combined techniques in chemistry] | 15 h |
| vi | Nowoczesne trendy w energetyce - zielona energia [Modern trends in energy - green] | 15 h |
| vii | Techniki badań tworzyw sztucznych [Plastics Research Techniques] | 15 h |
| viii | Nowoczesne techniki eksperymentalne [Modern experimental techniques] | 15 h |
| ix | Układy cienkowarstwowe – otrzymywanie i właściwości [Thin-film systems – preparation and properties] | 15 h |

| 12 | Blok przedmiotów do wyboru z dyscypliny rolnictwo i ogrodnictwo [Block of elective subjects from the discipline of agriculture and horticulture] | Godzin [hours] |
|---|---|---|
| i | Agronomia [Agronomy] | 30 h |
| ii | Biogeochemia [Biogeochemistry] | 30 h |
| iii | Biotechnologia rolnicza [Agricultural biotechnology] | 30 h |
| iv | Nowoczesne metody badań w układzie gleba-roślina [Modern methods of research in the soil-plant system] | 30 h |

| 12 | Blok przedmiotów do wyboru z dyscyplin informatyka techniczna i telekomunikacja; automatyka, elektronika, elektrotechnika i technologie kosmiczne [Block of subjects to choose from the disciplines of technical information technology and telecommunications; automation, electronics, electrical engineering and space technologies] | Godzin [hours] |
|---|---|---|
| i | Efektywne przekształcanie energii w agrotechnice [Efficient energy conversion in agrotechnology] | 15 h |
| ii | Cyfrowe przetwarzanie sygnałów [Digital Signal Processing] | 15 h |

| | | |
|---|---|---|
| iii | Sztuczna inteligencja oraz nowoczesne metody przetwarzania danych w badaniach naukowych [Artificial intelligence and modern data processing methods in scientific research] | 30 h |
| iv | Zarządzanie pracą współczesnych i przyszłych systemów energetycznych [Managing the operation of contemporary and future energy systems] | 15 h |
| v | Zarządzanie projektami, zespołami i komunikacja społeczna [Project management, team management and social communication] | 30 h |

| 12 | Blok przedmiotów do wyboru z dyscypliny zootechnika i rybactwo [Block of elective subjects from the discipline of animal science and fisheries] | Godzin [hours] |
|---|---|---|
| i | Statystyczna weryfikacja hipotez badawczych [Statistical verification of research hypotheses] | 30 h |
| ii | Ekotechnologie [Ecotechnologies] | 30 h |
| iii | Akwakultura [Aquaculture] | 30 h |
| iv | Ochrona środowiska przyrodniczego człowieka [Protection of the natural human environment] | 30 h |
| v | Modele zwierzęce *in vitro* w badaniach naukowych [In vitro models in animal research] | 30 h |
| vi | Higiena i toksykologia produktów mięsnych [Hygiene and toxicology of meat products] | 15 h |
| vii | Anatomia i fizjologia zwierząt gospodarskich [Anatomy and physiology of farm animals] | 15 h |
| viii | Nauka i technologia w kształtowaniu rynku rolnego [Science and technology in shaping agricultural field] | 15 h |

| 12 | Blok przedmiotów do wyboru z dyscypliny inżynieria lądowa i transport [Block of elective subjects from the discipline of civil engineering and transport] | Godzin [hours] |
|---|---|---|
| i | Ochrona przegród budowlanych przed oddziaływaniem środowiska [Protection of building partitions against environmental impacts] | 15 h |
| ii | Zarządzanie przedsięwzięciami budowlanymi w perspektywie zrównoważonego rozwoju [Managing construction projects in the perspective of sustainable development] | 15 h |
| iii | Trwałość konstrukcji budowlanych [Durability of building structures] | 15 h |
| iv | Betony nowej generacji i konstrukcje betonowe [New generation concretes and concrete structures] | 15 h |
| v | Nowoczesne konstrukcje metalowe [Modern metal structures] | 15 h |
| vi | Inżynieria wiatrowa [Wind engineering] | 15 h |

## MATRYCA ZGODNOŚCI EFEKTÓW UCZENIA SIĘ NA POZIOMIE 8 PRK Z PLANEM KSZTAŁCENIA NR 2
## [COMPATIBILITY MATRIX OF LEARNING OUTCOMES AT LEVEL 8 PQF WITH EDUCATIONAL PLAN NO. 2]

| Numer i opis efektów uczenia się [Number and description of learning outcomes] | | Liczba przemiotów pokrywających efekt uczenia się [Number of subjects covering the learning outcome] | Numer i nazwa przedmiotu [Subject number and name] | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| | | | Metodologia i planowanie badań [Research Methodology and Planning] | Metody numeryczne [Numerical Methods] | Retoryka [Rethoric] | Angielski w nauce [English Language in Science] | Niezbędnik grantowy [Essential Information on Grants] | Współczesne trendy w rozwoju nauki [Contemporary Trends in Scientific | Przygotowanie artykułów i prezentacji naukowych [Preparation of Articles and Scientific Presentations] | Analiza i prezentacja danych [Data Analysis - Statistics, Data Visualisation] | Filozofia poznania [Philosophy of Cognition] | Etyka w nauce [Ethics in Science] | Blok przedmiotów ogólnych do wyboru [Block of general subjects to choose from] | Blok przedmiotów z dyscypliny do wyboru [Block of subjects from the | Przedsiębiorczość akademicka [Academic Entrepreneurship] | Praktyka zawodowa [Internship] | Seminarium doktoranckie [Dissertation Workshop] |
| | | | Liczba pokrytych efektów uczenia się [Number of learning outcomes covered] | | | | | | | | | | | | | | |
| | | | 4 | 4 | 4 | 2 | 7 | 7 | 6 | 4 | 4 | 6 | 10 | 6 | 7 | 4 | 12 |
| **WIEDZA: zna i rozumie [KNOWLAGE: knows and understands]** | | | | | | | | | | | | | | | | | |
| P8S_WG: Zakres i głębia – kompletność perspektywy poznawczej i zależności [Depth and scope - completeness of the cognitive perspective and dependencies] | | | | | | | | | | | | | | | | | |
| a) w stopniu umożliwiającym rewizję istniejących paradygmatów – światowy dorobek, obejmujący podstawy teoretyczne oraz zagadnienia ogólne i wybrane zagadnienia szczegółowe – właściwe dla danej dyscypliny naukowej lub artystycznej | [a) the world's achievements relating to: theoretical foundations, general and selected specific issues of the academic or artistic discipline at a level enabling the revision of existing paradigms] | 4 | | | | | | ✓ | | | ✓ | | | ✓ | | | ✓ |
| b) główne tendencje rozwojowe dyscyplin naukowych lub artystycznych, w których odbywa się kształcenie | [b) the main scientific developments in the academic or artistic disciplines essential to the study | 3 | | | | | | ✓ | | | | | | ✓ | | | ✓ |
| c) metodologię badań naukowych | [c) the methodology of scientific research] | 7 | ✓ | ✓ | | | | | ✓ | ✓ | ✓ | | | ✓ | | | ✓ |
| d) zasady upowszechniania wyników działalności naukowej, także w trybie otwartego dostępu | [d) principles of dissemination of the results of scientific activities, also in the open access mode] | 3 | | | | | ✓ | | ✓ | | | | | | ✓ | | |
| P8S_WK: Kontekst – uwarunkowania, skutki [Context - conditions, effects] | | | | | | | | | | | | | | | | | |
| a) fundamentalne dylematy współczesnej cywilizacji | [a) the fundamental dilemmas of modern civilization] | 2 | | | | | | ✓ | | | ✓ | | | | | | |
| b) ekonomiczne, prawne, etyczne i inne istotne uwarunkowania działalności naukowej | [b) the economic, legal and other essential conditions of conducting scientific research] | 2 | | | | | | ✓ | | | | ✓ | | | | | |
| c) podstawowe zasady transferu wiedzy do sfery gospodarczej i społecznej oraz komercjalizacji wyników działalności naukowej i know-how związanego z tymi wynikami | [c) basic principles of knowledge transfer to the economic and social spheres and commercialization of the results of scientific activities and know-how related to these results | 4 | | | | | ✓ | | | | | | ✓ | ✓ | ✓ | | |
| **UMIEJĘTNOŚCI: potrafi [SKILLS: is able to]** | | | | | | | | | | | | | | | | | |
| P8S_UW: Wykorzystanie wiedzy – rozwiązywane problemy i wykonywane zadania [Using knowledge - solving problems and carrying out tasks] | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a) wykorzystywać wiedzę z różnych dziedzin nauki lub dziedziny sztuki do twórczego identyfikowania, formułowania i innowacyjnego rozwiązywania złożonych problemów lub wykonywania zadań o charakterze badawczym, a w szczególności: definiować cel i przedmiot badań naukowych, formułować hipotezę badawczą, rozwijać metody, techniki i narzędzia badawcze oraz twórczo je stosować, wnioskować na podstawie wyników badań naukowych | [a) take advantage of knowledge from different academic or artistic fields to creatively identify, formulate and innovatively solve complex problems or perform research activities, especially: to define the aim and subject of the research, formulate a research hypothesis, develop research methods, techniques and tools and use them creatively, draw conclusions on the basis of research results | 6 | ✓ | ✓ | | | | ✓ | | ✓ | | | ✓ | ✓ | | | |
| b) dokonywać krytycznej analizy i oceny wyników badań naukowych, działalności eksperckiej i innych prac o charakterze twórczym oraz ich wkładu w rozwój wiedzy | [b) critically analyze and evaluate the results of scientific research, expert activity and other creative work and their contribution to the development of knowledge] | 5 | ✓ | ✓ | | | | | ✓ | ✓ | | ✓ | | | | | |
| c) transferować wyniki działalności naukowej do sfery gospodarczej i społecznej | [c) transfer the results of research studies to the economic and social spheres] | 3 | | | | | ✓ | | | | | | ✓ | | ✓ | | |
| P8S_UK: Komunikowanie się – odbieranie i tworzenie wypowiedzi, upowszechnianie wiedzy w środowisku naukowym i posługiwanie się językiem obcym [Communication - understanding and formulating statements, disseminating knowledge in the academic community and using a foregin language] | | | | | | | | | | | | | | | | | |
| a) komunikować się na tematy specjalistyczne w stopniu umożliwiającym aktywne uczestnictwo w międzynarodowym środowisku naukowym | [a) communicate on specialist topics to the extent that enables active participation in the international scientific community] | 3 | | | ✓ | ✓ | | | | | | | | | | | ✓ |
| b) upowszechniać wyniki działalności naukowej, także w formach popularnych | [b) disseminate research results, also to the general public] | 4 | | | ✓ | | | | ✓ | | | | ✓ | | ✓ | | |
| c) inicjować debatę | [c) initiate debates] | 4 | | | ✓ | | | | | | | | ✓ | | | ✓ | ✓ |
| d) uczestniczyć w dyskursie naukowym | [d) participate in academic discourse] | 2 | | | ✓ | | | | | | | | | | | | ✓ |
| e) posługiwać się językiem obcym na poziomie B2 Europejskiego Systemu Opisu Kształcenia Językowego w stopniu umożliwiającym uczestnictwo w międzynarodowym środowisku naukowymi zawodowym | [e) speak a foreign language at level B2 of the Common European Framework of Reference for Languages (CEFR) to an extent enabling participation in an international professional scientific environment] | 1 | | | | ✓ | | | | | | | | | | | |
| P8S_UO: Organizacja pracy – planowanie i praca zespołowa [Organising work - planning and team work] | | | | | | | | | | | | | | | | | |
| a) planować i realizować indywidualne i zespołowe przedsięwzięcia badawcze lub twórcze, także w środowisku międzynarodowym | [a) plan and implement one's own and a team's research or creative work, also in the international community] | 4 | | | | | ✓ | | | | | | ✓ | | ✓ | ✓ | |
| P8S_UU: Uczenie się – planowanie własnego rozwoju i rozwoju innych osób [Learning - planning personal development and development of others] | | | | | | | | | | | | | | | | | |
| a) samodzielnie planować i działać na rzecz własnego rozwoju oraz inspirować i organizować rozwój innych osób | [a) autonomously plan and act to achieve personal development and inspire and organise the development of others] | 5 | | | | | | | | | | ✓ | ✓ | | ✓ | ✓ | ✓ |
| b) planować zajęcia lub grupy zajęć i realizować je z wykorzystaniem nowoczesnych metod i narzędzi | [b) develop an education or training programme and implement it using modern methods and tools] | 3 | | | | | | | | | | | ✓ | | | ✓ | ✓ |
| **KOMPETENCJE SPOŁECZNE: jest gotów do [SOCIAL COMPETENCE: is ready to]** | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P8S_KK: Oceny – krytyczne podejście<br>[Evaluation - critical approach] | | | | | | | | | | | | | | | | | |
| a) krytycznej oceny dorobku w ramach danej dyscypliny naukowej lub artystycznej | [a) critically evaluate the achievements of one's academic discipline] | 3 | | | | | | ✓ | | | | | | ✓ | | | ✓ |
| b) krytycznej oceny własnego wkładu w rozwój danej dyscypliny naukowej lub artystycznej | [b) critically evaluate one's contributions to the development of that field] | 3 | | | | | | ✓ | ✓ | | | | | | | | ✓ |
| c) uznawania znaczenia wiedzy w rozwiązywaniu problemów poznawczych i praktycznych | [c) recognize the value of knowledge in solving cognitive and practical problems] | 5 | ✓ | ✓ | | | | | | ✓ | ✓ | | | | | | ✓ |
| P8S_KO: Odpowiedzialność – wypełnianie zobowiązań społecznych i działanie na rzecz interesu publicznego<br>[Responsibility - fulfillin social obligations and acting in the public interest] | | | | | | | | | | | | | | | | | |
| a) wypełniania zobowiązań społecznych badaczy i twórców | [a) fulfil the social obligations of researchers and artists] | 2 | | | | | ✓ | | | | | ✓ | | | | | |
| b) inicjowania działań na rzecz interesu publicznego | [b) initiate activities on behalf of the public interest] | 2 | | | | | ✓ | | | | | ✓ | | | | | |
| c) myślenia i działania w sposób przedsiębiorczy | [c) think and act in an enterprising manner] | 3 | | | | | ✓ | | | | | | ✓ | | ✓ | | |
| P8S_KR: Rola zawodowa – niezależność i rozwój etosu<br>[Professional role - autonomy and development of an ethos] | | | | | | | | | | | | | | | | | |
| a) podtrzymywania i rozwijania etosu środowisk badawczych i twórczych, w tym: prowadzenia działalności naukowej w sposób niezależny, respektowania zasady publicznej własności wyników działalności naukowej, z uwzględnieniem zasad ochrony własności intelektualnej | [a) uphold and develop the ethos of the research and artistic communities,<br>including: conducting research in an independent manner, respecting the principle of the public ownership of academic research<br>results, taking into account intellectual property | 4 | | | | | | | ✓ | | | ✓ | ✓ | | | | ✓ |

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# CRITERION 1

## Adequacy of the curriculum and individual research plans to the learning outcomes for qualifications at level 8 of the PRK and their implementation

**Curriculum**

**PBŚ Doctoral School**
**Programme No. II**
**Correction I**

POLITECHNIKA
BYDGOSKA
im. Jana i Jędrzeja Śniadeckich

# Resolution No. 15/479
## Senate
## Bydgoszcz University of Science and Technology
of 22 March 2023

**on the amendment of Resolution No. 7/467 of the Senate of the PBS of 19 January 2022 on the establishment of the Training Programme No. 2 for the Doctoral School of the Bydgoszcz University of Science and Technology**

Based on:

- § 173(2) of the Statute of the Bydgoszcz University of Science and Technology (i.e. introduced by Resolution No. 1/460 of the Senate of the Bydgoszcz University of Science and Technology of 14 July 2021) in conjunction with Article 201(4) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2021, item 478, as amended);

*Senate*
*Bydgoszcz University of Science and Technology*
*resolves as follows:*

**§ 1**

The Annex to Resolution No. 7/467 of the Senate of the PBŚ of 19 January 2022 on the establishment of the Training Programme No. 2 for the Doctoral School of the Bydgoszcz University of Science and Technology is amended as Annex (1.1, 1.2, 1.3) to this Resolution.

**§ 2**

The resolution enters into force on October 1, 2023.

President of the Senate
Rector

Prof. Marek ADAMSKI

Szkoła Doktorska
Politechnika Bydgoska
im. Jana i Jędrzeja Śniadeckich
[PBS Doctoral School]

# Plan kształcenia nr 2

obowiązuje od roku akademickiego 2022/2023
[from the academic year 2022/2023]

| poz. [no.] | nazwa przedmiotu [subjects] | godzin [hours] | semestr [semester] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | I | II | III | IV | V | VI | VII | VIII |
| 1 | Metodologia i planowanie badań [Research Methodology and Planning] | 45 | 15 | 30 | | | | | | |
| 2 | Metody numeryczne [Numerical Methods] | 15 | 15 | | | | | | | |
| 3 | Retoryka [Rethoric] | 15 | 15 | | | | | | | |
| 4 | Angielski w nauce [English Language in Science] | 60 | 15 | 15 | 15 | 15 | | | | |
| 5 | Niezbędnik grantowy [Essential Information on Grants] | 15 | | 15 | | | | | | |
| 6 | Współczesne trendy w rozwoju nauki [Contemporary Trends in Scientific Development] | 60 | | 15 | 15 | 15 | 15 | | | |
| 7 | Przygotowanie artykułów i prezentacji naukowych [Preparation of Articles and Scientific Presentations] | 30 | | | 15 | 15 | | | | |
| 8 | Analiza danych - statystyka, wizualizacja danych [Data Analysis - Statistics, Data Visualisation] | 45 | | | 15 | 30 | | | | |
| 9 | Filozofia poznania [Philosophy of Cognition] | 10 | | | | | 10 | | | |
| 10 | Etyka w nauce [Ethics in Science] | 5 | | | | | 5 | | | |
| 11 | Blok przedmiotów ogólnych do wyboru [Block of general subjects to choose from]* | 30 | | | | | 30 | | | |
| 12 | Blok przedmiotów z dyscypliny do wyboru [Block of subjects from the discipline to choose from]* | 60 | | | | | | 60 | | |
| 13 | Przedsiębiorczość akademicka [Academic Entrepreneurship] | 15 | | | | | | | 15 | |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 14 | Praktyka zawodowa [Internship] | 60 | | | | | | | 30 | 30 |
| 15 | Seminarium doktoranckie [Dissertation Workshop] | 120 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| | | | 75 | 90 | 75 | 90 | 75 | 75 | 60 | 45 |
| | razem godzin: | 585 | liczba godzin w semestrze [hours per semester] | | | | | | | |

Uwagi [Comments]:

# - przedmiot realizowany oddzielnie w grupie dyscyplin [subjects run separately in groups of technical and natural science disciplines]

**# - egzamin [exam]**

* - dodatkowe listy przedmiotów [additional subjects lists]

| 11 | Blok przedmiotów ogólnych do wyboru | Godzin |
|---|---|---|
| i | Badania i rozwój w przedsiębiorstwach [Research and development in enterprises] | 15 h |
| ii | Dydaktyka szkoły wyższej z elementami metodyki [Higher school didactics with elements of methodology] | 15 h |
| iii | Influencer marketing [Influencer marketing] | 15 h |
| iv | Umiejętności miękkie w praktyce [Soft skills in practice] | 15 h |
| v | Własna firma czy praca w korporacji – co lepsze? [Own business or work in a corporation – which is better?] | 15 h |
| vi | Inwentyka [Invention Techniques] | 15 h |
| | … | |

| 12 | Blok przedmiotów do wyboru z dyscypliny inżynieria mechaniczna [Block of elective subjects from the discipline of mechanical engineering] | Godzin [hours] |
|---|---|---|
| i | Cykl życia maszyn i procesów [Machine and process life cycle] | 15 h |
| ii | Inżynieria w ujęciu systemowym [Engineering from a systems perspective] | 15 h |
| iii | Materiałoznastwo [Materials science] | 15 h |
| iv | Mechanika analityczna [Analytical mechanics] | 15 h |
| v | Metoda elementów skończonych [Finite Element Method] | 15 h |
| vi | Teoria sprężystości i plastyczności [Theory of elasticity and plasticity] | 15 h |

| 12 | Blok przedmiotów do wyboru z dyscypliny nauki chemiczne [Block of elective subjects from the discipline of chemical sciences] | Godzin [hours] |
|---|---|---|
| i | Termodynamika techniczna [Technical thermodynamics] | 30 h |
| ii | NANO -fizyka, informatyka, technologia [Hot topics in modern physics] | 15 h |
| iii | Nanokompozyty polimerowe [Polymer nanocomposites] | 15 h |
| iv | Nowoczesne techniki analizy jakościowej i ilościowej w chromatografii gazowej [Modern techniques of qualitative and quantitative analysis in gas chromatography] | 30 h |
| v | Nowoczesne techniki łączone w chemii analitycznej [Modern combined techniques in chemistry] | 15 h |
| vi | Nowoczesne trendy w energetyce - zielona energia [Modern trends in energy - green] | 15 h |
| vii | Techniki badań tworzyw sztucznych [Plastics Research Techniques] | 15 h |
| viii | Nowoczesne techniki eksperymentalne [Modern experimental techniques] | 15 h |
| ix | Układy cienkowarstwowe – otrzymywanie i właściwości [Thin-film systems – preparation and properties] | 15 h |

| 12 | Blok przedmiotów do wyboru z dyscypliny rolnictwo i ogrodnictwo [Block of elective subjects from the discipline of agriculture and horticulture] | Godzin [hours] |
|---|---|---|
| i | Agronomia [Agronomy] | 30 h |
| ii | Biogeochemia [Biogeochemistry] | 30 h |
| iii | Biotechnologia rolnicza [Agricultural biotechnology] | 30 h |
| iv | Nowoczesne metody badań w układzie gleba-roślina [Modern methods of research in the soil-plant system] | 30 h |

| 12 | Blok przedmiotów do wyboru z dyscyplin informatyka techniczna i telekomunikacja; automatyka, elektronika, elektrotechnika i technologie kosmiczne [Block of subjects to choose from the disciplines of technical information technology and telecommunications; automation, electronics, electrical engineering and space technologies] | Godzin [hours] |
|---|---|---|
| i | Efektywne przekształcanie energii w agrotechnice [Efficient energy conversion in agrotechnology] | 15 h |
| ii | Cyfrowe przetwarzanie sygnałów [Digital Signal Processing] | 15 h |
| iii | Sztuczna inteligencja oraz nowoczesne metody przetwarzania danych w badaniach naukowych [Artificial intelligence and modern data processing methods in scientific research] | 30 h |

| | | |
|---|---|---|
| iv | Zarządzanie pracą współczesnych i przyszłych systemów energetycznych [Managing the operation of contemporary and future energy systems] | 15 h |
| v | Zarządzanie projektami, zespołami i komunikacja społeczna [Project management, team management and social communication] | 30 h |

| 12 | Blok przedmiotów do wyboru z dyscypliny zootechnika i rybactwo [Block of elective subjects from the discipline of animal science and fisheries] | Godzin [hours] |
|---|---|---|
| i | Ekotechnologie [Ecotechnologies] | 15 |
| ii | Bioinformatyka [Bioinformatics] | 30 |
| iii | Nauka i technologia w kształtowaniu rynku rolnego [Science and technology in shaping agricultural field] | 15 |
| iv | Zarządzanie projektami B+R [R&D project management] | 15 |
| v | Zwierzęce modele badawcze [Animal research models] | 15 |
| vi | Żywność nowej generacji [New generation food] | 15 |

| 12 | Blok przedmiotów do wyboru z dyscypliny inżynieria lądowa i transport [Block of elective subjects from the discipline of civil engineering and transport] | Godzin [hours] |
|---|---|---|
| i | Ochrona przegród budowlanych przed oddziaływaniem środowiska [Protection of building partitions against environmental impacts] | 15 h |
| ii | Zarządzanie przedsięwzięciami budowlanymi w perspektywie zrównoważonego rozwoju [Managing construction projects in the perspective of sustainable development] | 15 h |
| iii | Trwałość konstrukcji budowlanych [Durability of building structures] | 15 h |
| iv | Betony nowej generacji i konstrukcje betonowe [New generation concretes and concrete structures] | 15 h |
| v | Nowoczesne konstrukcje metalowe [Modern metal structures] | 15 h |
| vi | Inżynieria wiatrowa [Wind engineering] | 15 h |

## MATRYCA ZGODNOŚCI EFEKTÓW UCZENIA SIĘ NA POZIOMIE 8 PRK Z PLANEM KSZTAŁCENIA NR 2
## [COMPATIBILITY MATRIX OF LEARNING OUTCOMES AT LEVEL 8 PQF WITH EDUCATIONAL PLAN NO. 2]

| Numer i opis efektów uczenia się [Number and description of learning outcomes] | | Liczba przemiotów pokrywających efekt uczenia się [Number of subjects covering the learning outcome] | Numer i nazwa przedmiotu [Subject number and name] | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| | | | Metodologia i planowanie badań [Research Methodology and Planning] | Metody numeryczne [Numerical Methods] | Retoryka [Rethoric] | Angielski w nauce [English Language in Science] | Niezbędnik grantowy [Essential Information on Grants] | Współczesne trendy w rozwoju nauki [Contemporary Trends in Scientific | Przygotowanie artykułów i prezentacji naukowych [Preparation of Articles and Scientific Presentations] | Analiza i prezentacja danych [Data Analysis - Statistics, Data Visualisation] | Filozofia poznania [Philosophy of Cognition] | Etyka w nauce [Ethics in Science] | Blok przedmiotów ogólnych do wyboru [Block of general subjects to choose from] | Blok przedmiotów z dyscypliny do wyboru [Block of subjects from the | Przedsiębiorczość akademicka [Academic Entrepreneurship] | Praktyka zawodowa [Internship] | Seminarium doktoranckie [Dissertation Workshop] |
| | | | Liczba pokrytych efektów uczenia się [Number of learning outcomes covered] | | | | | | | | | | | | | | |
| | | | 4 | 4 | 4 | 2 | 7 | 7 | 6 | 4 | 4 | 6 | 10 | 6 | 7 | 4 | 12 |
| **WIEDZA: zna i rozumie [KNOWLAGE: knows and understands]** | | | | | | | | | | | | | | | | | |
| P8S_WG: Zakres i głębia – kompletność perspektywy poznawczej i zależności [Depth and scope - completeness of the cognitive perspective and dependencies] | | | | | | | | | | | | | | | | | |
| a) w stopniu umożliwiającym rewizję istniejących paradygmatów – światowy dorobek, obejmujący podstawy teoretyczne oraz zagadnienia ogólne i wybrane zagadnienia szczegółowe – właściwe dla danej dyscypliny naukowej lub artystycznej | [a) the world's achievements relating to: theoretical foundations, general and selected specific issues of the academic or artistic discipline at a level enabling the revision of existing paradigms] | 4 | | | | | | ✓ | | | ✓ | | | ✓ | | | ✓ |
| b) główne tendencje rozwojowe dyscyplin naukowych lub artystycznych, w których odbywa się kształcenie | [b) the main scientific developments in the academic or artistic disciplines essential to the study | 3 | | | | | | ✓ | | | | | | ✓ | | | ✓ |
| c) metodologię badań naukowych | [c) the methodology of scientific research] | 7 | ✓ | ✓ | | | | | ✓ | ✓ | ✓ | | | ✓ | | | ✓ |
| d) zasady upowszechniania wyników działalności naukowej, także w trybie otwartego dostępu | [d) principles of dissemination of the results of scientific activities, also in the open access mode] | 3 | | | | | ✓ | | ✓ | | | | | | ✓ | | |
| P8S_WK: Kontekst – uwarunkowania, skutki [Context - conditions, effects] | | | | | | | | | | | | | | | | | |
| a) fundamentalne dylematy współczesnej cywilizacji | [a) the fundamental dilemmas of modern civilization] | 2 | | | | | | ✓ | | | ✓ | | | | | | |
| b) ekonomiczne, prawne, etyczne i inne istotne uwarunkowania działalności naukowej | [b) the economic, legal and other essential conditions of conducting scientific research] | 2 | | | | | | ✓ | | | | ✓ | | | | | |
| c) podstawowe zasady transferu wiedzy do sfery gospodarczej i społecznej oraz komercjalizacji wyników działalności naukowej i know-how związanego z tymi wynikami | [c) basic principles of knowledge transfer to the economic and social spheres and commercialization of the results of scientific activities and know-how related to these results | 4 | | | | | ✓ | | | | | | ✓ | ✓ | ✓ | | |
| **UMIEJĘTNOŚCI: potrafi [SKILLS: is able to]** | | | | | | | | | | | | | | | | | |
| P8S_UW: Wykorzystanie wiedzy – rozwiązywane problemy i wykonywane zadania [Using knowledge - solving problems and carrying out tasks] | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a) wykorzystywać wiedzę z różnych dziedzin nauki lub dziedziny sztuki do twórczego identyfikowania, formułowania i innowacyjnego rozwiązywania złożonych problemów lub wykonywania zadań o charakterze badawczym, a w szczególności: definiować cel i przedmiot badań naukowych, formułować hipotezę badawczą, rozwijać metody, techniki i narzędzia badawcze oraz twórczo je stosować, wnioskować na podstawie wyników badań naukowych | [a) take advantage of knowledge from different academic or artistic fields to creatively identify, formulate and innovatively solve complex problems or perform research activities, especially: to define the aim and subject of the research, formulate a research hypothesis, develop research methods, techniques and tools and use them creatively, draw conclusions on the basis of research results | 6 | ✓ | ✓ | | | | ✓ | | ✓ | | | ✓ | ✓ | | | |
| b) dokonywać krytycznej analizy i oceny wyników badań naukowych, działalności eksperckiej i innych prac o charakterze twórczym oraz ich wkładu w rozwój wiedzy | [b) critically analyze and evaluate the results of scientific research, expert activity and other creative work and their contribution to the development of knowledge] | 5 | ✓ | ✓ | | | | | ✓ | ✓ | | ✓ | | | | | |
| c) transferować wyniki działalności naukowej do sfery gospodarczej i społecznej | [c) transfer the results of research studies to the economic and social spheres] | 3 | | | | | ✓ | | | | | | ✓ | | ✓ | | |
| P8S_UK: Komunikowanie się – odbieranie i tworzenie wypowiedzi, upowszechnianie wiedzy w środowisku naukowym i posługiwanie się językiem obcym [Communication - understanding and formulating statements, disseminating knowledge in the academic community and using a foregin language] | | | | | | | | | | | | | | | | | |
| a) komunikować się na tematy specjalistyczne w stopniu umożliwiającym aktywne uczestnictwo w międzynarodowym środowisku naukowym | [a) communicate on specialist topics to the extent that enables active participation in the international scientific community] | 3 | | | ✓ | ✓ | | | | | | | | | | | ✓ |
| b) upowszechniać wyniki działalności naukowej, także w formach popularnych | [b) disseminate research results, also to the general public] | 4 | | | ✓ | | | | ✓ | | | | ✓ | | ✓ | | |
| c) inicjować debatę | [c) initiate debates] | 4 | | | ✓ | | | | | | | | ✓ | | | ✓ | ✓ |
| d) uczestniczyć w dyskursie naukowym | [d) participate in academic discourse] | 2 | | | ✓ | | | | | | | | | | | | ✓ |
| e) posługiwać się językiem obcym na poziomie B2 Europejskiego Systemu Opisu Kształcenia Językowego w stopniu umożliwiającym uczestnictwo w międzynarodowym środowisku naukowymi zawodowym | [e) speak a foreign language at level B2 of the Common European Framework of Reference for Languages (CEFR) to an extent enabling participation in an international professional scientific environment] | 1 | | | | ✓ | | | | | | | | | | | |
| P8S_UO: Organizacja pracy – planowanie i praca zespołowa [Organising work - planning and team work] | | | | | | | | | | | | | | | | | |
| a) planować i realizować indywidualne i zespołowe przedsięwzięcia badawcze lub twórcze, także w środowisku międzynarodowym | [a) plan and implement one's own and a team's research or creative work, also in the international community] | 4 | | | | | ✓ | | | | | | ✓ | | ✓ | ✓ | |
| P8S_UU: Uczenie się – planowanie własnego rozwoju i rozwoju innych osób [Learning - planning personal development and development of others] | | | | | | | | | | | | | | | | | |
| a) samodzielnie planować i działać na rzecz własnego rozwoju oraz inspirować i organizować rozwój innych osób | [a) autonomously plan and act to achieve personal development and inspire and organise the development of others] | 5 | | | | | | | | | | ✓ | ✓ | | ✓ | ✓ | ✓ |
| b) planować zajęcia lub grupy zajęć i realizować je z wykorzystaniem nowoczesnych metod i narzędzi | [b) develop an education or training programme and implement it using modern methods and tools] | 3 | | | | | | | | | | | ✓ | | | ✓ | ✓ |
| **KOMPETENCJE SPOŁECZNE: jest gotów do [SOCIAL COMPETENCE: is ready to]** | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P8S_KK: Oceny – krytyczne podejście<br>[Evaluation - critical approach] | | | | | | | | | | | | | | | | | |
| a) krytycznej oceny dorobku w ramach danej dyscypliny naukowej lub artystycznej | [a) critically evaluate the achievements of one's academic discipline] | 3 | | | | | | ✓ | | | | | | ✓ | | | ✓ |
| b) krytycznej oceny własnego wkładu w rozwój danej dyscypliny naukowej lub artystycznej | [b) critically evaluate one's contributions to the development of that field] | 3 | | | | | | ✓ | ✓ | | | | | | | | ✓ |
| c) uznawania znaczenia wiedzy w rozwiązywaniu problemów poznawczych i praktycznych | [c) recognize the value of knowledge in solving cognitive and practical problems] | 5 | ✓ | ✓ | | | | | | ✓ | ✓ | | | | | | ✓ |
| P8S_KO: Odpowiedzialność – wypełnianie zobowiązań społecznych i działanie na rzecz interesu publicznego<br>[Responsibility - fulfillin social obligations and acting in the public interest] | | | | | | | | | | | | | | | | | |
| a) wypełniania zobowiązań społecznych badaczy i twórców | [a) fulfil the social obligations of researchers and artists] | 2 | | | | | ✓ | | | | | ✓ | | | | | |
| b) inicjowania działań na rzecz interesu publicznego | [b) initiate activities on behalf of the public interest] | 2 | | | | | ✓ | | | | | ✓ | | | | | |
| c) myślenia i działania w sposób przedsiębiorczy | [c) think and act in an enterprising manner] | 3 | | | | | ✓ | | | | | | ✓ | | ✓ | | |
| P8S_KR: Rola zawodowa – niezależność i rozwój etosu<br>[Professional role - autonomy and development of an ethos] | | | | | | | | | | | | | | | | | |
| a) podtrzymywania i rozwijania etosu środowisk badawczych i twórczych, w tym: prowadzenia działalności naukowej w sposób niezależny, respektowania zasady publicznej własności wyników działalności naukowej, z uwzględnieniem zasad ochrony własności intelektualnej | [a) uphold and develop the ethos of the research and artistic communities, including: conducting research in an independent manner, respecting the principle of the public ownership of academic research results, taking into account intellectual property | 4 | | | | | | | ✓ | | | ✓ | ✓ | | | | ✓ |

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# CRITERION 1

## Adequacy of the curriculum and individual research plans to the learning outcomes for qualifications at level 8 of the PRK and their implementation

**Curriculum**

**PBŚ Doctoral School**
**Programme No. II**
**Correction II**

POLITECHNIKA
BYDGOSKA
im. Jana i Jędrzeja Śniadeckich

# Resolution No. 24/483
## Senate
## Bydgoszcz University of Science and Technology
of 14 July 2023

**amending Resolution No. 7/467 of the Senate of the PBŚ of 19 January 2022 on the establishment of the Training Programme No. 2 for the Doctoral School of the Bydgoszcz University of Science and Technology**

Pursuant to § 173(2) of the Statute of the Bydgoszcz University of Science and Technology in conjunction with Article 201(4) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2023, item 742);

*Senate*
*Bydgoszcz University of Science and Technology*
*resolves as follows:*

**§ 1**

In Resolution No. 7/467 of the PBŚ Senate of 19 January 2022 on the establishment of the Training Programme No. 2 for the Doctoral School of the Bydgoszcz University of Science and Technology, the annex is amended as the annex to this resolution.

**§ 2**

The resolution enters into force on 26 February 2024.

President of the Senate
Rector

Prof. Marek ADAMSKI

Szkoła Doktorska
Politechnika Bydgoska
im. Jana i Jędrzeja Śniadeckich
[PBS Doctoral School]

od roku akademickiego 2023/2024
[from the academic year 2023/2024]

| poz. [no.] | nazwa przedmiotu [subjects] | godzin [hours] | semestr [semester] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | I | II | III | IV | V | VI | VII | VIII |
| 1 | Metodologia i planowanie badań [Research Methodology and Planning] | 45 | 15 | 30 | | | | | | |
| 2 | Metody numeryczne [Numerical Methods] | 15 | 15 | | | | | | | |
| 3 | Retoryka [Rethoric] | 15 | 15 | | | | | | | |
| 4 | Angielski w nauce [English Language in Science] | 60 | 15 | 15 | 15 | 15 | | | | |
| 5 | Niezbędnik grantowy [Essential Information on Grants] | 15 | | 15 | | | | | | |
| 6 | Współczesne trendy w rozwoju nauki [Contemporary Trends in Scientific Development] | 60 | | 15 | 15 | 15 | 15 | | | |
| 7 | Przygotowanie artykułów i prezentacji naukowych [Preparation of Articles and Scientific Presentations] | 30 | | | 15 | 15 | | | | |
| 8 | Analiza danych - statystyka, wizualizacja danych [Data Analysis - Statistics, Data Visualisation] | 45 | | | 15 | 30 | | | | |
| 9 | Filozofia poznania [Philosophy of Cognition] | 10 | | | | | 10 | | | |
| 10 | Etyka w nauce [Ethics in Science] | 5 | | | | | 5 | | | |
| 11 | Blok przedmiotów ogólnych do wyboru [Block of general subjects to choose from]* | 30 | | | | | 30 | | | |
| 12 | Blok przedmiotów z dyscypliny do wyboru [Block of subjects from the discipline to choose from]* | 60 | | | | | | 60 | | |
| 13 | Przedsiębiorczość akademicka [Academic Entrepreneurship] | 15 | | | | | | | 15 | |
| 14 | Praktyka zawodowa [Internship] | 60 | | | | | | | 30 | 30 |
| 15 | Seminarium doktoranckie [Dissertation Workshop] | 120 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| | | | 75 | 90 | 75 | 90 | 75 | 75 | 60 | 45 |
| | razem godzin: | 585 | liczba godzin w semestrze [hours per semester] | | | | | | | |

Uwagi [Comments]:

# - przedmiot realizowany oddzielnie w grupie dyscyplin [subjects run separately in groups of technical and natural science disciplines]

**# - egzamin [exam]**

* - dodatkowe listy przedmiotów [additional subjects lists]

| 11 | Blok przedmiotów ogólnych do wyboru [General elective subjects block] | Godzin [hours] |
|---|---|---|
| i | Badania i rozwój w przedsiębiorstwach [Research and development in enterprises] | 15 |
| ii | Dydaktyka szkoły wyższej z elementami metodyki [Higher school didactics with elements of methodology] | 15 |
| iii | Influencer marketing [Influencer marketing] | 15 |
| iv | Umiejętności miękkie w praktyce [Soft skills in practice] | 15 |
| v | Własna firma czy praca w korporacji – co lepsze? [Own business or work in a corporation – which is better?] | 15 |
| vi | Inwentyka [Invention Techniques] | 15 |
| vii | Zarządzanie wiedzą w nauce i w biznesie [Knowledge management in science and business] | 15 |
| viii | Prowadzenie projektów innowacyjnych [Conducting innovative projects] | 15 |
| vii | Metody badania powierzchni [Surface testing methods] | 15 |
| viii | Analiza wielowymiarowych danych analitycznych [Analysis of multidimensional analytical data] | 15 |

| 12 | Blok przedmiotów do wyboru z dyscypliny inżynieria mechaniczna [Block of elective subjects from the discipline of mechanical engineering] | Godzin [hours] |
|---|---|---|
| i | Cykl życia maszyn i procesów [Machine and process life cycle] | 15 |
| ii | Inżynieria w ujęciu systemowym [Engineering from a systems perspective] | 15 |
| iii | Materiałoznastwo [Materials science] | 15 |
| iv | Mechanika analityczna [Analytical mechanics] | 15 |
| v | Metoda elementów skończonych [Finite Element Method] | 15 |
| vi | Teoria sprężystości i plastyczności [Theory of elasticity and plasticity] | 15 |

| 12 | Blok przedmiotów do wyboru z dyscypliny nauki chemiczne [Block of elective subjects from the discipline of chemical sciences] | Godzin [hours] |
|---|---|---|
| i | Termodynamika techniczna [Technical thermodynamics] | 30 |
| ii | NANO -fizyka, informatyka, technologia [Hot topics in modern physics] | 15 |
| iii | Nanokompozyty polimerowe [Polymer nanocomposites] | 15 |
| iv | Nowoczesne techniki analizy jakościowej i ilościowej w chromatografii gazowej [Modern techniques of qualitative and quantitative analysis in gas chromatography] | 30 |
| v | Nowoczesne techniki łączone w chemii analitycznej [Modern combined techniques in chemistry] | 15 |
| vi | Nowoczesne trendy w energetyce - zielona energia [Modern trends in energy - green] | 15 |
| vii | Techniki badań tworzyw sztucznych [Plastics Research Techniques] | 15 |
| viii | Nowoczesne techniki eksperymentalne [Modern experimental techniques] | 15 |
| ix | Układy cienkowarstwowe – otrzymywanie i właściwości [Thin-film systems – preparation and properties] | 15 |

| 12 | Blok przedmiotów do wyboru z dyscypliny rolnictwo i ogrodnictwo [Block of elective subjects from the discipline of agriculture and horticulture] | Godzin [hours] |
|---|---|---|
| i | Agronomia [Agronomy] | 30 |
| ii | Biogeochemia [Biogeochemistry] | 30 |
| iii | Biotechnologia rolnicza [Agricultural biotechnology] | 30 |
| iv | Nowoczesne metody badań w układzie gleba-roślina [Modern methods of research in the soil-plant system] | 30 |

| 12 | Blok przedmiotów do wyboru z dyscyplin informatyka techniczna i telekomunikacja; automatyka, elektronika, elektrotechnika i technologie kosmiczne [Block of subjects to choose from the disciplines of technical information technology and telecommunications; automation, electronics, electrical engineering and space technologies] | Godzin [hours] |
|---|---|---|
| i | Efektywne przekształcanie energii w agrotechnice [Efficient energy conversion in agrotechnology] | 15 |
| ii | Cyfrowe przetwarzanie sygnałów [Digital Signal Processing] | 15 |
| iii | Sztuczna inteligencja oraz nowoczesne metody przetwarzania danych w badaniach naukowych [Artificial intelligence and modern data processing methods in scientific research] | 30 |
| iv | Zarządzanie pracą współczesnych i przyszłych systemów energetycznych [Managing the operation of contemporary and future energy systems] | 15 |
| v | Zarządzanie projektami, zespołami i komunikacja społeczna [Project management, team management and social communication] | 30 |

| 12 | Blok przedmiotów do wyboru z dyscypliny zootechnika i rybactwo [Block of elective subjects from the discipline of animal science and fisheries] | Godzin [hours] |
|---|---|---|
| i | Ekotechnologie [Ecotechnologies] | 15 |
| ii | Bioinformatyka [Bioinformatics] | 30 |
| iii | Nauka i technologia w kształtowaniu rynku rolnego [Science and technology in shaping agricultural field] | 15 |
| iv | Zarządzanie projektami B+R [R&D project management] | 15 |
| v | Zwierzęce modele badawcze [Animal research models] | 15 |
| vi | Żywność nowej generacji [New generation food] | 15 |

| 12 | Blok przedmiotów do wyboru z dyscypliny inżynieria lądowa, geodezja i transport [Block of elective subjects from the discipline of civil engineering, geodesy and transport] | Godzin [hours] |
|---|---|---|
| i | Ochrona przegród budowlanych przed oddziaływaniem środowiska [Protection of building partitions against environmental impacts] | 15 |
| ii | Zarządzanie przedsięwzięciami budowlanymi w perspektywie zrównoważonego rozwoju [Managing construction projects in the perspective of sustainable development] | 15 |
| iii | Trwałość konstrukcji budowlanych [Durability of building structures] | 15 |
| iv | Betony nowej generacji i konstrukcje betonowe [New generation concretes and concrete structures] | 15 |
| v | Nowoczesne konstrukcje metalowe [Modern metal structures] | 15 |
| vi | Inżynieria wiatrowa [Wind engineering] | 15 |

| 12 | Blok przedmiotów do wyboru z dyscypliny nauki o zarządzaniu i jakości [Block of elective subjects from the discipline of management and quality science] | Godzin [hours] |
|---|---|---|
| i | Zarządzanie przedsiębiorstwem w warunkach zrównoważonego rozwoju [Enterprise management in the conditions of sustainable development] | 15 |
| ii | Nowoczesne typy przywództwa [Modern types of leadership] | 15 |
| iii | Zasobowo-procesowy rachunek kosztów [Resource-process cost accounting] | 30 |
| iv | Etyka biznesu [Business ethics] | 15 |
| v | Zarządzanie relacjami w biznesie [Business Relationship Management] | 15 |
| vi | Społeczne, ekonomiczne i ergonomiczne aspekty zarzadzania zasobami ludzkimi [Social, economic and ergonomic aspects of human resources management] | 15 |
| vii | Wykorzystanie nowoczesnych technologii w procesach zarządzania [The use of modern technologies in management processes] | 15 |

| 12 | Blok przedmiotów do wyboru z dyscypliny inżynieria chemiczna [A block of elective subjects from the discipline of chemical engineering] | Godzin [hours] |
|---|---|---|
| i | Bioreaktory membranowe [Membrane bioreactors] | 15 |
| ii | Inzynieria biomechaniczna w technologiach zrównoważonego rozwoju [Biomechanical Engineering in Sustainable Development Technologies] | 15 |
| iii | Optymalizacja procesów inżynierii chemicznej [Optimization of chemical engineering processes] | 15 |
| iv | Wybrane aspekty praktycznego zastosowania inżynierii chemicznej [Wybrane aspekty praktycznego zastosowania inżynierii chemicznej] | 15 |
| v | Nowoczesne metody badań materiałów polimerowych [Modern methods of testing polymer materials] | 15 |
| vi | Nowoczesne techniki przetwórstwa tworzyw [Modern techniques of plastics processing] | 15 |
| vii | Nowoczesne technologie antykorozyjne [Modern anti-corrosion technologies] | 15 |
| viii | Nowe zanieczyszczenia i ich środowiskowe efekty [New pollutants and their environmental effects] | 15 |
| ix | Nowoczesne metody usuwania metali w przemyśle i środowisku [Modern methods of metal removal in industry and the environment] | 15 |

## MATRYCA ZGODNOŚCI EFEKTÓW UCZENIA SIĘ NA POZIOMIE 8 PRK Z PLANEM KSZTAŁCENIA NR 2
## [COMPATIBILITY MATRIX OF LEARNING OUTCOMES AT LEVEL 8 PQF WITH EDUCATIONAL PLAN NO. 2]

| Numer i opis efektów uczenia się [Number and description of learning outcomes] | | Liczba przemiotów pokrywających efekt uczenia się [Number of subjects covering the learning outcome] | Numer i nazwa przedmiotu [Subject number and name] | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| | | | Metodologia i planowanie badań [Research Methodology and Planning] | Metody numeryczne [Numerical Methods] | Retoryka [Rethoric] | Angielski w nauce [English Language in Science] | Niezbędnik grantowy [Essential Information on Grants] | Współczesne trendy w rozwoju nauki [Contemporary Trends in Scientific Development] | Przygotowanie artykułów i prezentacji naukowych [Preparation of Articles and Scientific Presentations] | Analiza i prezentacja danych [Data Analysis - Statistics, Data Visualisation] | Filozofia poznania [Philosophy of Cognition] | Etyka w nauce [Ethics in Science] | Blok przedmiotów ogólnych do wyboru [Block of general subjects to choose from] | Blok przedmiotów z dyscypliny do wyboru [Block of subjects from the discipline to choose from] | Przedsiębiorczość akademicka [Academic Entrepreneurship] | Praktyka zawodowa [Internship] | Seminarium doktoranckie [Dissertation Workshop] |
| | | | Liczba pokrytych efektów uczenia się [Number of learning outcomes covered] | | | | | | | | | | | | | | |
| | | | 4 | 4 | 4 | 2 | 7 | 7 | 6 | 4 | 4 | 6 | 10 | 6 | 7 | 4 | 12 |
| **WIEDZA: zna i rozumie [KNOWLAGE: knows and understands]** | | | | | | | | | | | | | | | | | |
| P8S_WG: Zakres i głębia – kompletność perspektywy poznawczej i zależności [Depth and scope - completeness of the cognitive perspective and dependencies] | | | | | | | | | | | | | | | | | |
| a) w stopniu umożliwiającym rewizję istniejących paradygmatów – światowy dorobek, obejmujący podstawy teoretyczne oraz zagadnienia ogólne i wybrane zagadnienia szczegółowe – właściwe dla danej dyscypliny naukowej lub artystycznej | [a) the world's achievements relating to: theoretical foundations, general and selected specific issues of the academic or artistic discipline at a level enabling the revision of existing paradigms] | 4 | | | | | | ✓ | | | ✓ | | | ✓ | | | ✓ |
| b) główne tendencje rozwojowe dyscyplin naukowych lub artystycznych, w których odbywa się kształcenie | [b) the main scientific developments in the academic or artistic disciplines essential to the study | 3 | | | | | | ✓ | | | | | | ✓ | | | ✓ |
| c) metodologię badań naukowych | [c) the methodology of scientific research] | 7 | ✓ | ✓ | | | | | ✓ | ✓ | ✓ | | | ✓ | | | ✓ |
| d) zasady upowszechniania wyników działalności naukowej, także w trybie otwartego dostępu | [d) principles of dissemination of the results of scientific activities, also in the open access mode] | 3 | | | | | ✓ | | ✓ | | | | | | ✓ | | |
| P8S_WK: Kontekst – uwarunkowania, skutki [Context - conditions, effects] | | | | | | | | | | | | | | | | | |
| a) fundamentalne dylematy współczesnej cywilizacji | [a) the fundamental dilemmas of modern civilization] | 2 | | | | | | ✓ | | | ✓ | | | | | | |
| b) ekonomiczne, prawne, etyczne i inne istotne uwarunkowania działalności naukowej | [b) the economic, legal and other essential conditions of conducting scientific research] | 2 | | | | | | ✓ | | | | ✓ | | | | | |
| c) podstawowe zasady transferu wiedzy do sfery gospodarczej i społecznej oraz komercjalizacji wyników działalności naukowej i know-how związanego z tymi wynikami | [c) basic principles of knowledge transfer to the economic and social spheres and commercialization of the results of scientific activities and know-how related to these results | 4 | | | | | ✓ | | | | | | ✓ | ✓ | ✓ | | |
| **UMIEJĘTNOŚCI: potrafi [SKILLS: is able to]** | | | | | | | | | | | | | | | | | |
| P8S_UW: Wykorzystanie wiedzy – rozwiązywane problemy i wykonywane zadania [Using knowledge - solving problems and carrying out tasks] | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a) wykorzystywać wiedzę z różnych dziedzin nauki lub dziedziny sztuki do twórczego identyfikowania, formułowania i innowacyjnego rozwiązywania złożonych problemów lub wykonywania zadań o charakterze badawczym, a w szczególności: definiować cel i przedmiot badań naukowych, formułować hipotezę badawczą, rozwijać metody, techniki i narzędzia badawcze oraz twórczo je | [a) take advantage of knowledge from different academic or artistic fields to creatively identify, formulate and innovatively solve complex problems or perform research activities, especially: to define the aim and subject of the research, formulate a research hypothesis, develop research methods, techniques and tools and use them | 6 | ✓ | ✓ | | | | ✓ | | ✓ | | | ✓ | ✓ | | | |
| b) dokonywać krytycznej analizy i oceny wyników badań naukowych, działalności eksperckiej i innych prac o charakterze twórczym oraz ich wkładu w rozwój wiedzy | [b) critically analyze and evaluate the results of scientific research, expert activity and other creative work and their contribution to the development of knowledge] | 5 | ✓ | ✓ | | | | | ✓ | ✓ | | ✓ | | | | | |
| c) transferować wyniki działalności naukowej do sfery gospodarczej i społecznej | [c) transfer the results of research studies to the economic and social spheres] | 3 | | | | | ✓ | | | | | | ✓ | | ✓ | | |
| P8S_UK: Komunikowanie się – odbieranie i tworzenie wypowiedzi, upowszechnianie wiedzy w środowisku naukowym i posługiwanie się językiem obcym [Communication - understanding and formulating statements, disseminating knowledge in the academic community and using a foregin language] | | | | | | | | | | | | | | | | | |
| a) komunikować się na tematy specjalistyczne w stopniu umożliwiającym aktywne uczestnictwo w międzynarodowym środowisku naukowym | [a) communicate on specialist topics to the extent that enables active participation in the international scientific community] | 3 | | | ✓ | ✓ | | | | | | | | | | | ✓ |
| b) upowszechniać wyniki działalności naukowej, także w formach popularnych | [b) disseminate research results, also to the general public] | 4 | | | ✓ | | | | ✓ | | | | ✓ | | ✓ | | |
| c) inicjować debatę | [c) initiate debates] | 4 | | | ✓ | | | | | | | | ✓ | | | ✓ | ✓ |
| d) uczestniczyć w dyskursie naukowym | [d) participate in academic discourse] | 2 | | | ✓ | | | | | | | | | | | | ✓ |
| e) posługiwać się językiem obcym na poziomie B2 Europejskiego Systemu Opisu Kształcenia Językowego w stopniu umożliwiającym uczestnictwo w międzynarodowym środowisku naukowymi | [e) speak a foreign language at level B2 of the Common European Framework of Reference for Languages (CEFR) to an extent enabling participation in an international professional scientific environment] | 1 | | | | ✓ | | | | | | | | | | | |
| P8S_UO: Organizacja pracy – planowanie i praca zespołowa [Organising work - planning and team work] | | | | | | | | | | | | | | | | | |
| a) planować i realizować indywidualne i zespołowe przedsięwzięcia badawcze lub twórcze, także w środowisku międzynarodowym | [a) plan and implement one's own and a team's research or creative work, also in the international community] | 4 | | | | | ✓ | | | | | | ✓ | | ✓ | ✓ | |
| P8S_UU: Uczenie się – planowanie własnego rozwoju i rozwoju innych osób [Learning - planning personal development and development of others] | | | | | | | | | | | | | | | | | |
| a) samodzielnie planować i działać na rzecz własnego rozwoju oraz inspirować i organizować rozwój innych osób | [a) autonomously plan and act to achieve personal development and inspire and organise the development of others] | 5 | | | | | | | | | | ✓ | ✓ | | ✓ | ✓ | ✓ |
| b) planować zajęcia lub grupy zajęć i realizować je z wykorzystaniem nowoczesnych metod i narzędzi | [b) develop an education or training programme and implement it using modern methods and tools] | 3 | | | | | | | | | | | ✓ | | | ✓ | ✓ |
| **KOMPETENCJE SPOŁECZNE: jest gotów do [SOCIAL COMPETENCE: is ready to]** | | | | | | | | | | | | | | | | | |
| P8S_KK: Oceny – krytyczne podejście [Evaluation - critical approach] | | | | | | | | | | | | | | | | | |
| a) krytycznej oceny dorobku w ramach danej dyscypliny naukowej lub artystycznej | [a) critically evaluate the achievements of one's academic discipline] | 3 | | | | | | ✓ | | | | | | ✓ | | | ✓ |
| b) krytycznej oceny własnego wkładu w rozwój danej dyscypliny naukowej lub artystycznej | [b) critically evaluate one's contributions to the development of that field] | 3 | | | | | | ✓ | ✓ | | | | | | | | ✓ |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| c) uznawania znaczenia wiedzy w rozwiązywaniu problemów poznawczych i praktycznych | [c) recognize the value of knowledge in solving cognitive and practical problems] | 5 | ✓ | ✓ | | | | | | ✓ | ✓ | | | | | | ✓ |
| P8S_KO: Odpowiedzialność – wypełnianie zobowiązań społecznych i działanie na rzecz interesu publicznego<br>[Responsibility - fulfillin social obligations and acting in the public interest] | | | | | | | | | | | | | | | | | |
| a) wypełniania zobowiązań społecznych badaczy i twórców | [a) fulfil the social obligations of researchers and artists] | 2 | | | | | ✓ | | | | | ✓ | | | | | |
| b) inicjowania działań na rzecz interesu publicznego | [b) initiate activities on behalf of the public interest] | 2 | | | | | ✓ | | | | | ✓ | | | | | |
| c) myślenia i działania w sposób przedsiębiorczy | [c) think and act in an enterprising manner] | 3 | | | | | ✓ | | | | | | ✓ | | ✓ | | |
| P8S_KR: Rola zawodowa – niezależność i rozwój etosu<br>[Professional role - autonomy and development of an ethos] | | | | | | | | | | | | | | | | | |
| a) podtrzymywania i rozwijania etosu środowisk badawczych i twórczych, w tym: prowadzenia działalności naukowej w sposób niezależny, respektowania zasady publicznej własności wyników działalności naukowej, z uwzględnieniem zasad ochrony własności intelektualnej | [a) uphold and develop the ethos of the research and artistic communities, including: conducting research in an independent manner, respecting the principle of the public ownership of academic research results, taking into account intellectual property rights] | 4 | | | | | | | ✓ | | | ✓ | ✓ | | | | ✓ |

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# CRITERION 1

## Adequacy of the curriculum and individual research plans to the learning outcomes for qualifications at level 8 of the PRK and their implementation

**Curriculum**

**PBŚ Doctoral School**
**programme no. II**
**correction III**

POLITECHNIKA
BYDGOSKA
im. Jana i Jędrzeja Śniadeckich

# RESOLUTION No. 7/503
## Senate
## Bydgoszcz University of Science and Technology
of 19 March 2025

**amending Resolution No. 7/467 of the Senate of the Bydgoszcz University of Science and Technology of 19 January 2022 on the establishment of the Curriculum No. 2 for the Doctoral School of the Bydgoszcz University of Science and Technology**

Pursuant to § 173 sec. 2 of the Statute of the Bydgoszcz University of Science and Technology in connection with Article 201 sec. 4 of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2024, items 1571, 1871 and 1897)

*Senate*
*Bydgoszcz University of Science and Technology*
*resolves as follows:*

§ 1. In Resolution No. 7/467 of the Senate of the Bydgoszcz University of Science and Technology of 19 January 2022 on the establishment of the Educational Program No. 2 for the Doctoral School of the Bydgoszcz University of Science and Technology, the following changes are introduced:

1) Education Programme No. 2 education within the discipline of automation, electronics, electrical engineering and space technologies is excluded;
2) The annex to the resolution shall read in accordance with the annex to this resolution.

§ 2 The resolution shall enter into force on the date of its adoption.

**President of the Senate**
**Rector**

**Professor Marek ADAMSKI**

Szkoła Doktorska
Politechnika Bydgoska
im. Jana i Jędrzeja Śniadeckich
[PBS Doctoral School]

od roku akademickiego 2023/2024
[from the academic year 2023/2024]

| poz. [no.] | nazwa przedmiotu [subjects] | godzin [hours] | semestr [semester] | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | I | II | III | IV | V | VI | VII | VIII |
| 1 | Metodologia i planowanie badań [Research Methodology and Planning] | 45 | 15 | 30 | | | | | | |
| 2 | Metody numeryczne [Numerical Methods] | 15 | 15 | | | | | | | |
| 3 | Retoryka [Rethoric] | 15 | 15 | | | | | | | |
| 4 | Angielski w nauce [English Language in Science] | 60 | 15 | 15 | 15 | 15 | | | | |
| 5 | Niezbędnik grantowy [Essential Information on Grants] | 15 | | 15 | | | | | | |
| 6 | Współczesne trendy w rozwoju nauki [Contemporary Trends in Scientific Development] | 60 | | 15 | 15 | 15 | 15 | | | |
| 7 | Przygotowanie artykułów i prezentacji naukowych [Preparation of Articles and Scientific Presentations] | 30 | | | 15 | 15 | | | | |
| 8 | Analiza danych - statystyka, wizualizacja danych [Data Analysis - Statistics, Data Visualisation] | 45 | | | 15 | 30 | | | | |
| 9 | Filozofia poznania [Philosophy of Cognition] | 10 | | | | | 10 | | | |
| 10 | Etyka w nauce [Ethics in Science] | 5 | | | | | 5 | | | |
| 11 | Blok przedmiotów ogólnych do wyboru [Block of general subjects to choose from]* | 30 | | | | | 30 | | | |
| 12 | Blok przedmiotów z dyscypliny do wyboru [Block of subjects from the discipline to choose from]* | 60 | | | | | | 60 | | |
| 13 | Przedsiębiorczość akademicka [Academic Entrepreneurship] | 15 | | | | | | | 15 | |
| 14 | Praktyka zawodowa [Internship] | 60 | | | | | | | 30 | 30 |
| 15 | Seminarium doktoranckie [Dissertation Workshop] | 120 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| | | | 75 | 90 | 75 | 90 | 75 | 75 | 60 | 45 |
| | razem godzin: | 585 | liczba godzin w semestrze [hours per semester] | | | | | | | |

Uwagi [Comments]:

# - przedmiot realizowany oddzielnie w grupie dyscyplin [subjects run separately in groups of technical and natural science disciplines]

**# - egzamin [exam]**

* - dodatkowe listy przedmiotów [additional subjects lists]

| 11 | Blok przedmiotów ogólnych do wyboru [General elective subjects block] | Godzin [hours] |
|---|---|---|
| i | Badania i rozwój w przedsiębiorstwach [Research and development in enterprises] | 15 |
| ii | Dydaktyka szkoły wyższej z elementami metodyki [Higher school didactics with elements of methodology] | 15 |
| iii | Influencer marketing [Influencer marketing] | 15 |
| iv | Umiejętności miękkie w praktyce [Soft skills in practice] | 15 |
| v | Własna firma czy praca w korporacji – co lepsze? [Own business or work in a corporation – which is better?] | 15 |
| vi | Inwentyka [Invention Techniques] | 15 |
| vii | Zarządzanie wiedzą w nauce i w biznesie [Knowledge management in science and business] | 15 |
| viii | Prowadzenie projektów innowacyjnych [Conducting innovative projects] | 15 |
| ix | Metody badania powierzchni [Surface testing methods] | 15 |
| x | Analiza wielowymiarowych danych analitycznych [Analysis of multidimensional analytical data] | 15 |

| 12 | Blok przedmiotów do wyboru z dyscypliny inżynieria mechaniczna [Block of elective subjects from the discipline of mechanical engineering] | Godzin [hours] |
|---|---|---|
| i | Cykl życia maszyn i procesów [Machine and process life cycle] | 15 |
| ii | Inżynieria w ujęciu systemowym [Engineering from a systems perspective] | 15 |
| iii | Materiałoznastwo [Materials science] | 15 |
| iv | Mechanika analityczna [Analytical mechanics] | 15 |
| v | Metoda elementów skończonych [Finite Element Method] | 15 |
| vi | Teoria sprężystości i plastyczności [Theory of elasticity and plasticity] | 15 |

| 12 | Blok przedmiotów do wyboru z dyscypliny nauki chemiczne [Block of elective subjects from the discipline of chemical sciences] | Godzin [hours] |
|---|---|---|
| i | Termodynamika techniczna [Technical thermodynamics] | 30 |
| ii | NANO -fizyka, informatyka, technologia [Hot topics in modern physics] | 15 |
| iii | Nanokompozyty polimerowe [Polymer nanocomposites] | 15 |
| iv | Nowoczesne techniki analizy jakościowej i ilościowej w chromatografii gazowej [Modern techniques of qualitative and quantitative analysis in gas chromatography] | 30 |
| v | Nowoczesne techniki łączone w chemii analitycznej [Modern combined techniques in chemistry] | 15 |
| vi | Nowoczesne trendy w energetyce - zielona energia [Modern trends in energy - green] | 15 |
| vii | Techniki badań tworzyw sztucznych [Plastics Research Techniques] | 15 |
| viii | Nowoczesne techniki eksperymentalne [Modern experimental techniques] | 15 |
| ix | Układy cienkowarstwowe – otrzymywanie i właściwości [Thin-film systems – preparation and properties] | 15 |

| 12 | Blok przedmiotów do wyboru z dyscypliny rolnictwo i ogrodnictwo [Block of elective subjects from the discipline of agriculture and horticulture] | Godzin [hours] |
|---|---|---|
| i | Agronomia [Agronomy] | 30 |
| ii | Biogeochemia [Biogeochemistry] | 30 |
| iii | Biotechnologia rolnicza [Agricultural biotechnology] | 30 |
| iv | Nowoczesne metody badań w układzie gleba-roślina [Modern methods of research in the soil-plant system] | 30 |

| 12 | Blok przedmiotów do wyboru z dyscyplin informatyka techniczna i telekomunikacja [Block of subjects to choose from the disciplines of technical information technology and telecommunications] | Godzin [hours] |
|---|---|---|
| i | Efektywne przekształcanie energii w agrotechnice [Efficient energy conversion in agrotechnology] | 15 |
| ii | Cyfrowe przetwarzanie sygnałów [Digital Signal Processing] | 15 |
| iii | Sztuczna inteligencja oraz nowoczesne metody przetwarzania danych w badaniach naukowych [Artificial intelligence and modern data processing methods in scientific research] | 30 |
| iv | Zarządzanie pracą współczesnych i przyszłych systemów energetycznych [Managing the operation of contemporary and future energy systems] | 15 |
| v | Zarządzanie projektami, zespołami i komunikacja społeczna [Project management, team management and social communication] | 30 |

| 12 | Blok przedmiotów do wyboru z dyscypliny zootechnika i rybactwo [Block of elective subjects from the discipline of animal science and fisheries] | Godzin [hours] |
|---|---|---|
| i | Ekotechnologie [Ecotechnologies] | 15 |
| ii | Bioinformatyka [Bioinformatics] | 30 |
| iii | Nauka i technologia w kształtowaniu rynku rolnego [Science and technology in shaping agricultural field] | 15 |
| iv | Zarządzanie projektami B+R [R&D project management] | 15 |
| v | Zwierzęce modele badawcze [Animal research models] | 15 |
| vi | Żywność nowej generacji [New generation food] | 15 |

| 12 | Blok przedmiotów do wyboru z dyscypliny inżynieria lądowa, geodezja i transport [Block of elective subjects from the discipline of civil engineering, geodesy and transport] | Godzin [hours] |
|---|---|---|
| i | Ochrona przegród budowlanych przed oddziaływaniem środowiska [Protection of building partitions against environmental impacts] | 15 |
| ii | Zarządzanie przedsięwzięciami budowlanymi w perspektywie zrównoważonego rozwoju [Managing construction projects in the perspective of sustainable development] | 15 |

| | | |
|---|---|---|
| iii | Trwałość konstrukcji budowlanych [Durability of building structures] | 15 |
| iv | Betony nowej generacji i konstrukcje betonowe [New generation concretes and concrete structures] | 15 |
| v | Nowoczesne konstrukcje metalowe [Modern metal structures] | 15 |
| vi | Inżynieria wiatrowa [Wind engineering] | 15 |

| 12 | Blok przedmiotów do wyboru z dyscypliny nauki o zarządzaniu i jakości [Block of elective subjects from the discipline of management and quality science] | Godzin [hours] |
|---|---|---|
| i | Zarządzanie przedsiębiorstwem w warunkach zrównoważonego rozwoju [Enterprise management in the conditions of sustainable development] | 15 |
| ii | Nowoczesne typy przywództwa [Modern types of leadership] | 15 |
| iii | Zasobowo-procesowy rachunek kosztów [Resource-process cost accounting] | 30 |
| iv | Etyka biznesu [Business ethics] | 15 |
| v | Zarządzanie relacjami w biznesie [Business Relationship Management] | 15 |
| vi | Społeczne, ekonomiczne i ergonomiczne aspekty zarzadzania zasobami ludzkimi [Social, economic and ergonomic aspects of human resources management] | 15 |
| vii | Wykorzystanie nowoczesnych technologii w procesach zarządzania [The use of modern technologies in management processes] | 15 |

| 12 | Blok przedmiotów do wyboru z dyscypliny inżynieria chemiczna [A block of elective subjects from the discipline of chemical engineering] | Godzin [hours] |
|---|---|---|
| i | Bioreaktory membranowe [Membrane bioreactors] | 15 |
| ii | Inzynieria biomechaniczna w technologiach zrównoważonego rozwoju [Biomechanical Engineering in Sustainable Development Technologies] | 15 |
| iii | Wybrane aspekty praktycznego zastosowania inżynierii chemicznej [Wybrane aspekty praktycznego zastosowania inżynierii chemicznej] | 15 |
| iv | Nowoczesne metody badań materiałów polimerowych [Modern methods of testing polymer materials] | 15 |
| v | Nowoczesne techniki przetwórstwa tworzyw [Modern techniques of plastics processing] | 15 |
| vi | Nowoczesne technologie antykorozyjne [Modern anti-corrosion technologies] | 15 |
| vii | Nowe zanieczyszczenia i ich środowiskowe efekty [New pollutants and their environmental effects] | 15 |
| viii | Nowoczesne metody usuwania metali w przemyśle i środowisku [Modern methods of metal removal in industry and the environment] | 15 |

## MATRYCA ZGODNOŚCI EFEKTÓW UCZENIA SIĘ NA POZIOMIE 8 PRK Z PLANEM KSZTAŁCENIA NR 2
## [COMPATIBILITY MATRIX OF LEARNING OUTCOMES AT LEVEL 8 PQF WITH EDUCATIONAL PLAN NO. 2]

| Numer i opis efektów uczenia się [Number and description of learning outcomes] | | Liczba przemiotów pokrywających efekt uczenia się [Number of subjects covering the learning outcome] | Numer i nazwa przedmiotu [Subject number and name] | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| | | | Metodologia i planowanie badań [Research Methodology and Planning] | Metody numeryczne [Numerical Methods] | Retoryka [Rethoric] | Angielski w nauce [English Language in Science] | Niezbędnik grantowy [Essential Information on Grants] | Współczesne trendy w rozwoju nauki [Contemporary Trends in Scientific Development] | Przygotowanie artykułów i prezentacji naukowych [Preparation of Articles and Scientific Presentations] | Analiza i prezentacja danych [Data Analysis - Statistics, Data Visualisation] | Filozofia poznania [Philosophy of Cognition] | Etyka w nauce [Ethics in Science] | Blok przedmiotów ogólnych do wyboru [Block of general subjects to choose from] | Blok przedmiotów z dyscypliny do wyboru [Block of subjects from the discipline to choose from] | Przedsiębiorczość akademicka [Academic Entrepreneurship] | Praktyka zawodowa [Internship] | Seminarium doktoranckie [Dissertation Workshop] |
| | | | Liczba pokrytych efektów uczenia się [Number of learning outcomes covered] | | | | | | | | | | | | | | |
| | | | 4 | 4 | 4 | 2 | 7 | 7 | 6 | 4 | 4 | 6 | 10 | 6 | 7 | 4 | 12 |
| **WIEDZA: zna i rozumie [KNOWLAGE: knows and understands]** | | | | | | | | | | | | | | | | | |
| P8S_WG: Zakres i głębia – kompletność perspektywy poznawczej i zależności [Depth and scope - completeness of the cognitive perspective and dependencies] | | | | | | | | | | | | | | | | | |
| a) w stopniu umożliwiającym rewizję istniejących paradygmatów – światowy dorobek, obejmujący podstawy teoretyczne oraz zagadnienia ogólne i wybrane zagadnienia szczegółowe – właściwe dla danej dyscypliny naukowej lub artystycznej | [a) the world's achievements relating to: theoretical foundations, general and selected specific issues of the academic or artistic discipline at a level enabling the revision of existing paradigms] | 4 | | | | | | ✓ | | | ✓ | | | ✓ | | | ✓ |
| b) główne tendencje rozwojowe dyscyplin naukowych lub artystycznych, w których odbywa się kształcenie | [b) the main scientific developments in the academic or artistic disciplines essential to the study | 3 | | | | | | ✓ | | | | | | ✓ | | | ✓ |
| c) metodologię badań naukowych | [c) the methodology of scientific research] | 7 | ✓ | ✓ | | | | | ✓ | ✓ | ✓ | | | ✓ | | | ✓ |
| d) zasady upowszechniania wyników działalności naukowej, także w trybie otwartego dostępu | [d) principles of dissemination of the results of scientific activities, also in the open access mode] | 3 | | | | | ✓ | | ✓ | | | | | | ✓ | | |
| P8S_WK: Kontekst – uwarunkowania, skutki [Context - conditions, effects] | | | | | | | | | | | | | | | | | |
| a) fundamentalne dylematy współczesnej cywilizacji | [a) the fundamental dilemmas of modern civilization] | 2 | | | | | | ✓ | | | ✓ | | | | | | |
| b) ekonomiczne, prawne, etyczne i inne istotne uwarunkowania działalności naukowej | [b) the economic, legal and other essential conditions of conducting scientific research] | 2 | | | | | | ✓ | | | | ✓ | | | | | |
| c) podstawowe zasady transferu wiedzy do sfery gospodarczej i społecznej oraz komercjalizacji wyników działalności naukowej i know-how związanego z tymi wynikami | [c) basic principles of knowledge transfer to the economic and social spheres and commercialization of the results of scientific activities and know-how related to these results | 4 | | | | | ✓ | | | | | | ✓ | ✓ | ✓ | | |
| **UMIEJĘTNOŚCI: potrafi [SKILLS: is able to]** | | | | | | | | | | | | | | | | | |
| P8S_UW: Wykorzystanie wiedzy – rozwiązywane problemy i wykonywane zadania [Using knowledge - solving problems and carrying out tasks] | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| a) wykorzystywać wiedzę z różnych dziedzin nauki lub dziedziny sztuki do twórczego identyfikowania, formułowania i innowacyjnego rozwiązywania złożonych problemów lub wykonywania zadań o charakterze badawczym, a w szczególności: definiować cel i przedmiot badań naukowych, formułować hipotezę badawczą, rozwijać metody, techniki i narzędzia badawcze oraz twórczo je | [a) take advantage of knowledge from different academic or artistic fields to creatively identify, formulate and innovatively solve complex problems or perform research activities, especially: to define the aim and subject of the research, formulate a research hypothesis, develop research methods, techniques and tools and use them | 6 | ✓ | ✓ | | | | ✓ | | ✓ | | | ✓ | ✓ | | | |
| b) dokonywać krytycznej analizy i oceny wyników badań naukowych, działalności eksperckiej i innych prac o charakterze twórczym oraz ich wkładu w rozwój wiedzy | [b) critically analyze and evaluate the results of scientific research, expert activity and other creative work and their contribution to the development of knowledge] | 5 | ✓ | ✓ | | | | | ✓ | ✓ | | ✓ | | | | | |
| c) transferować wyniki działalności naukowej do sfery gospodarczej i społecznej | [c) transfer the results of research studies to the economic and social spheres] | 3 | | | | | ✓ | | | | | | ✓ | | ✓ | | |
| P8S_UK: Komunikowanie się – odbieranie i tworzenie wypowiedzi, upowszechnianie wiedzy w środowisku naukowym i posługiwanie się językiem obcym [Communication - understanding and formulating statements, disseminating knowledge in the academic community and using a foregin language] | | | | | | | | | | | | | | | | | |
| a) komunikować się na tematy specjalistyczne w stopniu umożliwiającym aktywne uczestnictwo w międzynarodowym środowisku naukowym | [a) communicate on specialist topics to the extent that enables active participation in the international scientific community] | 3 | | | ✓ | ✓ | | | | | | | | | | | ✓ |
| b) upowszechniać wyniki działalności naukowej, także w formach popularnych | [b) disseminate research results, also to the general public] | 4 | | | ✓ | | | | ✓ | | | | ✓ | | ✓ | | |
| c) inicjować debatę | [c) initiate debates] | 4 | | | ✓ | | | | | | | | ✓ | | | ✓ | ✓ |
| d) uczestniczyć w dyskursie naukowym | [d) participate in academic discourse] | 2 | | | ✓ | | | | | | | | | | | | ✓ |
| e) posługiwać się językiem obcym na poziomie B2 Europejskiego Systemu Opisu Kształcenia Językowego w stopniu umożliwiającym uczestnictwo w międzynarodowym środowisku naukowymi | [e) speak a foreign language at level B2 of the Common European Framework of Reference for Languages (CEFR) to an extent enabling participation in an international professional scientific environment] | 1 | | | | ✓ | | | | | | | | | | | |
| P8S_UO: Organizacja pracy – planowanie i praca zespołowa [Organising work - planning and team work] | | | | | | | | | | | | | | | | | |
| a) planować i realizować indywidualne i zespołowe przedsięwzięcia badawcze lub twórcze, także w środowisku międzynarodowym | [a) plan and implement one's own and a team's research or creative work, also in the international community] | 4 | | | | | ✓ | | | | | | ✓ | | ✓ | ✓ | |
| P8S_UU: Uczenie się – planowanie własnego rozwoju i rozwoju innych osób [Learning - planning personal development and development of others] | | | | | | | | | | | | | | | | | |
| a) samodzielnie planować i działać na rzecz własnego rozwoju oraz inspirować i organizować rozwój innych osób | [a) autonomously plan and act to achieve personal development and inspire and organise the development of others] | 5 | | | | | | | | | | ✓ | ✓ | | ✓ | ✓ | ✓ |
| b) planować zajęcia lub grupy zajęć i realizować je z wykorzystaniem nowoczesnych metod i narzędzi | [b) develop an education or training programme and implement it using modern methods and tools] | 3 | | | | | | | | | | | ✓ | | | ✓ | ✓ |
| **KOMPETENCJE SPOŁECZNE: jest gotów do [SOCIAL COMPETENCE: is ready to]** | | | | | | | | | | | | | | | | | |
| P8S_KK: Oceny – krytyczne podejście [Evaluation - critical approach] | | | | | | | | | | | | | | | | | |
| a) krytycznej oceny dorobku w ramach danej dyscypliny naukowej lub artystycznej | [a) critically evaluate the achievements of one's academic discipline] | 3 | | | | | | ✓ | | | | | | ✓ | | | ✓ |
| b) krytycznej oceny własnego wkładu w rozwój danej dyscypliny naukowej lub artystycznej | [b) critically evaluate one's contributions to the development of that field] | 3 | | | | | | ✓ | ✓ | | | | | | | | ✓ |

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| c) uznawania znaczenia wiedzy w rozwiązywaniu problemów poznawczych i praktycznych | [c) recognize the value of knowledge in solving cognitive and practical problems] | 5 | ✓ | ✓ | | | | | | ✓ | ✓ | | | | | | ✓ |
| P8S_KO: Odpowiedzialność – wypełnianie zobowiązań społecznych i działanie na rzecz interesu publicznego<br>[Responsibility - fulfillin social obligations and acting in the public interest] | | | | | | | | | | | | | | | | | |
| a) wypełniania zobowiązań społecznych badaczy i twórców | [a) fulfil the social obligations of researchers and artists] | 2 | | | | | ✓ | | | | | ✓ | | | | | |
| b) inicjowania działań na rzecz interesu publicznego | [b) initiate activities on behalf of the public interest] | 2 | | | | | ✓ | | | | | ✓ | | | | | |
| c) myślenia i działania w sposób przedsiębiorczy | [c) think and act in an enterprising manner] | 3 | | | | | ✓ | | | | | | ✓ | | ✓ | | |
| P8S_KR: Rola zawodowa – niezależność i rozwój etosu<br>[Professional role - autonomy and development of an ethos] | | | | | | | | | | | | | | | | | |
| a) podtrzymywania i rozwijania etosu środowisk badawczych i twórczych, w tym: prowadzenia działalności naukowej w sposób niezależny, respektowania zasady publicznej własności wyników działalności naukowej, z uwzględnieniem zasad ochrony własności intelektualnej | [a) uphold and develop the ethos of the research and artistic communities, including: conducting research in an independent manner, respecting the principle of the public ownership of academic research results, taking into account intellectual property rights] | 4 | | | | | | | ✓ | | | ✓ | ✓ | | | | ✓ |

POLITECHNIKA BYDGOSKA
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# CRITERION 2

# Method of verification of learning outcomes for qualifications at level 8 of the PRK

## Syllabuses

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 1 |
| Item Name | **RESEARCH METHODOLOGY AND PLANNING** |
| Course coordinator responsible for preparing the syllabus | prof. dr hab. inż. Anna Wenda-Piesik |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| Semester | hours | Host |
|---|---|---|
| **I** | **15[E]** | prof. dr. hab. inż. Anna Wenda-Piesik |

[E] - exam

**Disciplines of natural sciences and engineering and technology**
**prof. dr. hab. inż. Anna Wenda-Piesik**

Lecture 1. The scientific paradigm and its importance in the development of civilization.
Lecture 2. Definitions and structure of science. Science as creativity, heuristics.
Lecture 3. Types of human knowledge. Features of scientific knowledge.
Lecture 4. Deduction and deductive sciences. Stages of development of deductive systems.
Lecture 5. Deductive inferences in the development of logic.
Lecture 6. Empiricism and Inductive Methods.
Lecture 7. Mill's canons.
Lecture 8. Reasoning and justifications in science.
Lecture 9. Principles of investigating scientific problems.
Lecture 10. Methods of analysis and synthesis in applied research.
Lecture 11. Coincidence, imagination, talent and intuition in science.
Lecture 12. Conceptualism and concepts of research processes.
Lecture 13. Classification of sciences according to subject and methodological criteria.
Lecture 14. Classification and degrees of scientific classifications.
Lecture 15. Recognition, the power of the scientist's influence.

| | | |
|---|---|---|
| **II** | **30[E]*** | prof. dr. hab. inż. Anna Wenda-Piesik<br>dr hab. inż. Adam Lipski, prof. PBŚ |

[E] - exam
*- subject taught separately in a group of disciplines

**Disciplines of natural sciences**
**prof. dr. hab. inż. Anna Wenda-Piesik**

Lecture 1. History and development of experimental methods in the natural sciences in the world.
Lecture 2. Introduction to experimental methods (Experiment and science, paradoxes of deformation and artificiality of experiments).
Lecture 3. Formulating and justifying the topics of scientific papers, setting the goals of research work, formulating hypotheses, the role of hypotheses, reasoning.

Lecture 4. Introduction to statistics, the role of statistics in research, data validation. Advantages and disadvantages of statistics.
Lecture 5. An introduction to measurement theory and errors made in scientific research.
Lecture 6. Types of measurement scales and the possibility of using statistics at different scales. Overview of statistical methods for data analysis.
Lecture 7. Rules for sampling and making observations and measurements on various natural populations.
Lecture 8. Digitization and preparation of empirical data for statistical analysis in various statistical programs.
Lecture 9. Experience as a method of research in the natural sciences.
Lecture 10. Classification of experiments according to various criteria: place of conduct and experimental unit, number of factors studied, experimental arrangement (method of randomization), repetition in place and in seasons (series of experiments).
Lecture 11. Basic principles of conducting experiments in the laboratory, vegetation hall and field. Creating research plans.
Lecture 12. Division and characteristics of research methods in the natural sciences: observation method, exact experiment method, survey method and interview method.
Lecture 14. Types of questions, questionnaire construction, determination of the sample size and the method of its selection (random, systematic, stratified, group selection). Preparing data for analysis.
Lecture 15. Selection (and justification) of the research problem, aspects of research problems and separation of research tasks. Cognitive and utilitarian goals in the natural sciences. Research concepts in the discipline of agriculture and horticulture. Concept of research in the discipline of animal husbandry and fisheries.

**Disciplines of engineering and technical sciences**
**dr hab. inż. Adam Lipski, prof. PBŚ**

| | |
|---|---|
| Lecture 1. | Introduction to the problem of planning experiments. A brief historical outline. Object of research as a source of data. Classification of quantities characterizing the object of study. Mathematical model and function of the object of study. |
| Lecture 2. | Stages of implementation and analysis Results experiment plans. Classification and characterization of experiment plans. General criteria for selecting an experiment plan. |
| Lecture 3-5. | Impact materiality studies. Objectives. Types of plans, their characteristics and construction. Examples of preparation, implementation and processing of experimental results. |
| Lecture 6-8. | Complete plans. Objectives. Types of plans, their characteristics and construction. Examples of preparation, implementation and processing of experimental results. |
| Lecture 9-11. | Selection plans. Objectives. Types of plans, their characteristics and construction. Examples of preparation, implementation and processing of experimental results. |
| Lecture 12-14. | Optimization plans. Objectives. Types of plans, their characteristics and construction. Examples of preparation, implementation and processing of experimental results. |
| Lecture 15. | Selected aspects of methodology and experiment planning. Summary. |

## 3. TEACHING METHODS

multimedia lecture, demonstration, discussion, lecture, case method
sem. I lecture (15 hours)
sem. II lecture (30 hours)

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |

| | |
|---|---|
| P8S_WG_c | Scope and depth – completeness of cognitive perspective and dependencies c) methodology of scientific research in the field of natural and engineering-technical disciplines |
| SKILLS: can | |
| P8S_UW_a | Use of knowledge – problems solved and tasks performed a) Can creatively use knowledge of research methodology to identify, formulate and innovatively solve research tasks in the field of natural sciences and engineering and technology. Is able to prepare an individual research plan, i.e. a concept of own research, in which it includes the objectives and objects of scientific research, working hypotheses, research methods with the scope of measurements, as well as research techniques and tools. |
| P8S_UW_b | Use of knowledge – problems solved and tasks performed b) Can use methods of analysis and evaluation of scientific research results in order to verify research hypotheses, critically conduct conclusions. |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_c | Evaluations – a critical approach<br>c) recognizing the importance of knowledge in solving cognitive and practical problems in the field of a group of natural and engineering-technical disciplines and their contribution to the development of scientific knowledge. |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Project | … |
| P8S_WG_c | | X | | | | |
| P8S_UW_a | | | | | X | |
| P8S_UW_b | | | | | X | |
| P8S_KK_c | | | | | X | |

## 6. LITERATURE

**Basic Literature**

**Disciplines of natural sciences**
**prof. dr. hab. inż. Anna Wenda-Piesik**

1. Uwe Flick. Projektowanie badania jakościowego, Tytuł oryginalny: Designing Qualitative Research. Warszawa, 1, 2020, Wydawca: Wydawnictwo Naukowe PWN.
2. Steinar Kvale. Prowadzenie wywiadów. Warszawa, 1, 2020, Wydawca: Wydawnictwo Naukowe PWN.
3. David Silverman. Prowadzenie badań jakościowych. 2020, Wydawca: Wydawnictwo Naukowe PWN.
4. Stefan Nowak. Metodologia badań społecznych. Warszawa, 2012, Wydawca: Wydawnictwo Naukowe PWN.
5. Graham Gibbs. Analizowanie danych jakościowych. Tytuł oryginalny: Analyzing Qualitative Data. Wydanie: Warszawa, 1, 2011. Wydawca: Wydawnictwo Naukowe PWN
6. Zbigniew Bokszański. Indywidualizm a zmiana społeczna. Wydanie: Warszawa, 1, 2007, Wydawca: Wydawnictwo Naukowe PWN
7. David Silverman. Interpretacja danych jakościowych. Wydanie: Warszawa, 1, 2020

8. Wydawca: Wydawnictwo Naukowe PWN
9. Henryk Grabowski. Wykłady z metodologii badań empirycznych. Warszawa 2014. Wydawnictwo Impuls.

**Disciplines of engineering and technical sciences**
**dr hab. inż. Adam Lipski, prof. PBŚ**

1. Polański Z., 1984. Planowanie doświadczeń w technice. PWN, Warszawa.
2. Kukiełka L., 2002. Podstawy badań inżynierskich. PWN, Warszawa.

**Additional Literature**

**Disciplines of natural sciences**
**prof. dr. hab. inż. Anna Wenda-Piesik**

1. Franfort-Nachmias Ch, Nachmias D. 2002. Metody badawcze w naukach społecznych. Wydawnictwo Zysk i S-ka, Poznań.
2. Meissner W. 2010. Przewodnik do ćwiczeń z przedmiotu. Metody statystyczne w biologii. W UG, Gdańsk.

**Disciplines of engineering and technical sciences**
**dr hab. inż. Adam Lipski, prof. PBŚ**

1. Korzyński M., 2006. Metodyka eksperymentu. Planowanie, realizacja i statystyczne opracowanie wyników eksperymentów technologicznych. WNT, Warszawa.
2. Pająk E., Wieczorowski K., 1982. Podstawy optymalizacji operacji technologicznych w przykładach. PWN, Warszawa.
3. Mańczak K., 1976. Technika planowania eksperymentu. WNT, Warszawa.
4. Rekab K., Shaikh M., 2005. Statistical Design of Experiments with Engineering Approach. Chapman & Hall/CRC. Taylor & Francis Group.
5. Jiju A., 2003. Design of Experiments for Engineers and Scientists. Butterworth-Heinemann.

POLITECHNIKA BYDGOSKA
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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 2 |
| Item Name | **NUMERICAL METHODS** |
| Course coordinator responsible for preparing the syllabus | prof. dr hab. inż. Dariusz Skibicki |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **I** | **15** | prof. dr hab. inż. Dariusz Skibicki |

Lecture 1. Floating-point arithmetic in information technology. Computer errors, truncation errors and rounding errors.
Lecture 2. Linear matrix algebra. Basic properties of matrices. Solving systems of linear equations, exact methods, iterative methods.
Lecture 3. Linear and nonlinear approximation of one and many variables. Measures to assess the quality of approximation.
Lecture 4. Interpolation. Newtonian and Lagrange interpolation polynomials. Applications of interpolation in computer graphics – parametric interpolation.
Lecture 5. Numerical integration. Trapezoid and Simpson principle, Gaussian quadrature. Numerical differentiation. Forward, backward, and centered methods.
Lecture 6. Solving equations and systems of nonlinear equations. Chord and bisection method. The Newton-Raphson method in relation to solving a nonlinear equation and a system of nonlinear equations.
Lecture 7. Solving differential equations. Initial issues. Euler, Heun and Runge-Kutt methods. Boundary issues. Finite Difference Method. Finite Element Method.

## 3. TEACHING METHODS

Lecture - 15 hours
A multimedia lecture with a demonstration of issues and methods using a spreadsheet.

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_c | Scope and depth – completeness of cognitive perspective and dependencies<br>c) methodology of scientific research in the field of the use of numerical methods |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) use knowledge of numerical methods and creatively apply them to solve problems and perform research tasks |
| P8S_UW_b | Knowledge use – problems solved and tasks performed |

| | |
|---|---|
| | b) critically analyze and evaluate the results of scientific research, expert activity and other creative work using numerical methods |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_c | Evaluations – a critical approach<br>c) recognizing the importance of knowledge in the field of numerical methods in solving cognitive and practical problems, |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | … | … |
| P8S_WG_c | | | X | | | |
| P8S_UW_a | | | X | | | |
| P8S_UW_b | | | X | | | |
| P8S_KK_c | | | X | | | |

## 6. LITERATURE

| **Basic Literature** |
|---|
| 1. Skibicki D., Nowicki K., Metody numeryczne w budowie maszyn, Wydawnictwa Uczelniane Akademii Techniczno-Rolniczej w Bydgoszczy, 2006 |
| **Additional Literature** |
| 1. Chapra, Steven C., Canale, Raymond P., Numerical Methods for Engineers. McGraw Hill Education 7th ed, New York 2015. |

POLITECHNIKA BYDGOSKA
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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 3 |
| Item Name | **RHETORIC** |
| Course coordinator responsible for preparing the syllabus | dr inż. Marta Kładź-Kocot |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **I** | **15** | Marta Kładź-Kocot, PhD |

1. Rhetoric as *ars bene dicendi*.
2. A history of rhetoric.
3. Figures and rhetorical tropes.
4. Composition of a rhetorical statement.
5. The concepts of persuasion and manipulation.
6. Argumentative methods and techniques.
7. Effective persuasion techniques.
8. Self-presentation techniques and the art of public speaking

## 3. TEACHING METHODS

Lecture – 15 hours
Multimedia lecture, discussion, lecture

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| | SKILLS: can |
| P8S_UK_a | Communication – receiving and creating statements, disseminating knowledge in the scientific community and using a foreign language<br>a) using argumentative methods and techniques, communicate on specialist topics to the extent that allows active participation in the international scientific community |
| P8S_UK_b | Communication – receiving and creating statements, disseminating knowledge in the scientific community and using a foreign language<br>b) use the techniques of self-presentation and the art of public speaking to disseminate the results of scientific activity, also in popular forms |
| P8S_UK_c | Communication – receiving and creating statements, disseminating knowledge in the scientific community and using a foreign language<br>c) knowing effective techniques of persuasion, initiate a debate |
| P8S_UK_d | Communication – receiving and creating statements, disseminating knowledge in the scientific community and using a foreign language |

| | |
|---|---|
| | d) knowing argumentative methods and techniques, participate in scientific discourse |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Project | … |
| P8S_UK_a | | | | X | | |
| P8S_UK_b | | | | X | | |
| P8S_UK_c | | | | X | X | |
| P8S_UK_d | | | | X | X | |

## 6. LITERATURE

**Basic Literature**

1. Barłowska M., Budzyńska-Daca A., Wilczek P. (red), 2008, *Retoryka*, Wydawnictwo Naukowe PWN.
2. Korolko M., 1990, *Sztuka retoryki. Przewodnik encyklopedyczny*, Wiedza Powszechna.
3. Barłowska M., Budzyńska Daca A., Załęska M., 2010, *Ćwiczenia z retoryki*, Wydawnictwo Naukowe PWN.
4. Budzyńska-Daca A., Kwosek J., 2009, *Erystyka, czyli o sztuce prowadzenia sporów*, Wydawnictwo Naukowe PWN.
5. Beck G., 2010, *Wyższa szkoła skutecznej retoryki*, Wydawnictwo Helion.
6. Beck G., 2007, *Zakazana retoryka. Podręcznik manipulacji*, Wydawnictwo Helion.

**Additional Literature**

1. Meyer M., Carrilho M. M., Timmermans B., 2010, *Historia retoryki od Greków do dziś*, Wydawnictwo Aletheia.
2. Schopenhauer A., *Erystyka, czyli sztuka prowadzenia sporów*, wyd. dowolne.

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 4 |
| Item Name | **ENGLISH LANGUAGE IN SCIENCE** |
| Course coordinator responsible for preparing the syllabus | dr inż. Marta Giersz |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **I** | **15*** | Disciplines of engineering and technical sciences<br>Marta Giersz, PhD<br><br>Disciplines of natural sciences<br>mgr Małgorzata Borowska |

*subject taught separately in a discipline or group of disciplines

**Disciplines of engineering and technical sciences**
**dr inż. Marta Giersz**

1. Great scientists and their discoveries.
2. The most important inventions and their application.
3. Causes of equipment failure in various industrial fields (chemical, power plants, transportation, aviation) examples of failures due to fatigue

**Disciplines of natural sciences**
**mgr Małgorzata Borowska**

1. Water and air pollution.
2. Renewable energy.
3. Soil erosion.

| | | |
|---|---|---|
| **II** | **15*** | Disciplines of engineering and technical sciences<br>Marta Giersz, PhD<br><br>Disciplines of natural sciences<br>Małgorzata Borowska, MA |

*subject taught separately in a discipline or group of disciplines

**Disciplines of engineering and technical sciences**
**dr inż. Marta Giersz**

1. Basic issues in the field of mechanics.
2. Technology in communication.

3. Technology in business.

**Disciplines of natural sciences**
**mgr Małgorzata Borowska**

1. Endangered species.
2. Recycling.
3. Waste management.

| | | |
|---|---|---|
| **III** | **15*** | Disciplines of engineering and technical sciences<br>Marta Giersz, PhD<br><br>Disciplines of natural sciences<br>Małgorzata Borowska, MA |

*- subject taught separately in a group of disciplines

**Disciplines of engineering and technical sciences**
**dr inż. Marta Giersz**

1. Modern materials in various areas of life.
2. Sustainable development and ecology in various areas of life.
3. Articles and scientific presentations.

**Disciplines of natural sciences**
**mgr Małgorzata Borowska**

1. Nutrition and GMOs.
2. Enzymes and hormones.
3. Horticulture.

| | | |
|---|---|---|
| **IV** | **15E*** | Disciplines of engineering and technical sciences<br>Marta Giersz, PhD<br><br>Disciplines of natural sciences<br>Małgorzata Borowska, MA |

Yes - exam
*- subject taught separately in a group of disciplines

**Disciplines of engineering and technical sciences**
**dr inż. Marta Giersz**

1. Work, health and safety (CV and cover letter writing, job interview)
2. Presentations and public speaking in English.
3. Formal written forms.
4. Different styles of writing scientific papers, scientific articles, presenting research at a conference.

**Disciplines of natural sciences**
**mgr Małgorzata Borowska**

1. Landscape design and architecture.
2. Composting and mulching.
3. Fertilizers.

4. Different styles of writing scientific papers, scientific articles, presenting research at a conference.

## 3. TEACHING METHODS

Classes conducted in the form of laboratory exercises - work with the textbook and original materials, presentation, translations, didactic games, brainstorming, discussion
Sem. I Laboratory exercises (15 hours)
Sem. II Laboratory exercises (15 hours)
Sem. III Laboratory exercises (15 hours)
Sem. IV Laboratory exercises (15 hours)

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| SKILLS: can | |
| P8S_UK_a | Communication – receiving and creating statements, disseminating knowledge in the scientific community and using English<br>a) knowing the professional concepts in the field of a group of natural and engineering and technical disciplines, communicate on specialist topics to the extent that allows active participation in the international scientific community, in particular various styles of writing scientific papers, scientific articles, during public speeches and presenting research at conferences. |
| P8S_UK_e | Communication – receiving and creating statements, disseminating knowledge in the scientific community and using English<br>e) knowing professional terms in the field of a group of natural and engineering and technical disciplines, use English at the B2 level of the Common European Framework of Reference for Languages to a degree that allows participation in the international scientific and professional environment and during public speeches and scientific conferences conducted in English, as well as in scientific publications, etc. |
| SOCIAL COMPETENCE: is ready to | |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written submission | Written credit for the exercises | Presentation | | |
| P8S_UK_a | X | X | X | X | | |
| P8S_UK_e | X | X | X | X | | |

## 6. LITERATURE

| **Basic Literature** |
|---|

**Disciplines of engineering and technical sciences**
**dr inż. Marta Giersz**

1. Armer, T., 2011. Cambridge English for Scientists. Cambridge University Press
2. Ibbotson, M. 2009. Cambridge English for Engineering. Cambridge University Press

**Disciplines of natural sciences**
**mgr Małgorzata Borowska**

1. Armer, T., 2011. Cambridge English for Scientists. Cambridge University Press
2. Borowska, M., 2010. Animal Breeding and Biology: Professional English Textbook. University Publishing House of the University of Technology in Bydgoszcz.
3. Burczyk, K., 2008. English Texts: Agriculture and Animal Breeding. University Publishing Houses UTP in Bydgoszcz

**Additional Literature**

**Disciplines of engineering and technical sciences**
**dr inż. Marta Giersz**

1. Gałgańska B., 2010. Mechanical Devices Make Life Easier. University Publishing Houses UTP.
2. Otto B & M., 2005 Here is the News 1, 2, Oxford University Press
3. Thaine, C., 2020 Cambridge Academic English, Cambridge

**Disciplines of natural sciences**
**mgr Małgorzata Borowska**

1. Otto, M., B., 2007, Here is the news, Part 1. Poltex.
2. Kloc, E., 2009. English for Students of Horticulture. Publishing House of the University of Agriculture in Krakow

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 5 |
| Item Name | **ESSENTIAL INFORMATION ON GRANTS** |
| Course coordinator responsible for preparing the syllabus | prof. dr hab. inż. Michał Choraś |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **II** | **15** | prof. dr hab. inż. Michał Choraś<br>dr hab. inż. Jolanta Tomaszewska, prof. PBŚ |

During the course, students have the opportunity to see real national and EU applications submitted (won and lost) and their reviews. Students have the opportunity to see application forms for current competitions (e.g. Horizon Europe).

In addition, the following are discussed:

1. Formal aspects of the grant application: types of programmes, types of projects, budget and eligible costs in projects, division of costs by the purpose of expenditure (direct/indirect/other), basis for the evaluation of the application.
2. Aspects of building a consortium in grant projects: consortium initialization, meetings/events helpful in establishing consortia, where it is worth attending, types of partners, geographical balance and competences, division of roles in the project.
3. Aspects related to communication and work in a multicultural environment, tools helpful in working on research conclusions.
4. Substantive parts of the grant application:

– Formulation of the research problem, analysis of the current state of knowledge in the area of the requested grant, setting research goals (also going beyond the current state), definition of key performance indicators
– Research implementation – aspects of planning with the use of project management tools (PERT and Gantt diagrams), division of work into packages, identification of milestones, estimation of the workload needed to achieve them, risk analysis, budget shaping
– Assessment of the impact of research work on the scientific community and society - identification of end users, aspects of dissemination of results (identification of channels and content) and business modeling (commercialization), interdisciplinarity.
– Ethical aspects, privacy, data protection, GDPR, social aspects of research, gender aspects, security aspects
– The role of the coordinator, the role of the partner, aspects related to the effective management of research projects

## 3. TEACHING METHODS

| |
|---|
| Lecture – 15 hours<br>multimedia lecture |

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_d | Scope and depth – completeness of cognitive perspective and dependencies<br>d) the principles of dissemination of the results of scientific activity, thanks to the knowledge of end users and channels for the dissemination of the results of scientific work, |
| P8S_WK_c | Context – conditions, effects<br>c) learning about the aspects of building a consortium in grant projects, learns the basic principles of knowledge transfer to the economic and social spheres |
| SKILLS: can | |
| P8S_UW_c | Knowledge use – problems solved and tasks performed<br>c) use knowledge to build consortia and submit project proposals that solve specific problems and tasks |
| P8S_UO_a | Work organization – planning and teamwork<br>a) knowing the issues of implementation of scientific research in projects, plan and implement individual and team research or creative projects, also in an international environment |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KO_a | Responsibility – fulfilling social obligations and acting for the public interest<br>a) being aware of the impact of research work on the scientific community and society, fulfilling the social obligations of researchers and creators |
| P8S_KO_b | Responsibility – fulfilling social obligations and acting for the public interest<br>b) being aware of the impact of research work on the scientific community and society, understanding the ethical aspects of |
| P8S_KO_c | Responsibility – fulfilling social obligations and acting for the public interest<br>c) knowing the aspects of effective management of research projects, is ready to think and act in a team and project manner |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Oral exam | Written exam | Colloquium | Project | … |
|---|---|---|---|---|---|
| P8S_WG_d | | | | X | |
| P8S_WK_c | | | | X | |
| P8S_UW_c | | | | X | |
| P8S_UO_a | | | | X | |
| P8S_KO_a | | | | X | |
| P8S_KO_b | | | | X | |
| P8S_KO_c | | | | X | |

## 6. LITERATURE

| Basic Literature |
| --- |
| - |
| **Additional Literature** |
| - |

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 6 |
| Item Name | **CONTEMPORARY TRENDS IN THE DEVELOPMENT OF SCIENCE** |
| Course coordinator responsible for preparing the syllabus | prof. dr hab. inż. Maria Siwek-Gapińska |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **II** | **15** | prof. dr hab. inż. Dariusz Boroński<br>prof. dr hab. inż. Maria Siwek-Gapińska<br>dr hab. inż. Magdalena Stanek, prof. PBŚ<br>dr hab. inż. Mirosław Banaszak, prof. PBŚ<br>dr hab. inż. Maciej Walkowiak, prof. PBŚ<br>prof. dr hab. inż. Anna Wenda-Piesik<br>dr inż. Piotr Kiedrowski |

**prof. dr hab. inż. Dariusz Boroński**

1. Autonomous machines - cars, planes, household appliances and others.
2. Robotization and automation - application in industry and medicine.
3. Zero-emission drives - used in cars, planes, seagoing vessels.
4. Renewable energy sources and their application in the construction of passive technical facilities.
5. Bionics in mechanical engineering.
6. Modern materials and their application.
7. 3D printing.

| | | |
|---|---|---|
| **III** | **15** | prof. dr hab. inż. Dariusz Boroński<br>prof. dr hab. inż. Maria Siwek-Gapińska<br>dr hab. inż. Magdalena Stanek, prof. PBŚ<br>dr hab. inż. Mirosław Banaszak, prof. PBŚ<br>dr hab. inż. Maciej Walkowiak, prof. PBŚ<br>prof. dr hab. inż. Anna Wenda-Piesik<br>dr inż. Piotr Kiedrowski |

**prof. dr hab. inż. Maria Siwek-Gapińska (coordinator)**

1. The gastrointestinal tract and its microbiome - the "heart of immunity" (prof. dr hab. inż. Maria Siwek-Gapińska )
2. Biochemistry as an interdisciplinary science (dr hab. inż. Magdalena Stanek, prof. PBŚ)
3. Nutritional value of fish meat and its consumption (dr hab. inż. Magdalena Stanek, prof. PBŚ)
4. Genomics in the optimization of animal husbandry (prof. dr hab. inż. Maria Siwek-Gapińska).
5. "omics" technologies and their application in livestock research. (prof. dr hab. inż. Maria Siwek-Gapińska)
6. The importance of biosecurity for humans (dr hab. inż. Mirosław Banaszak, prof. PBŚ).
7. Market trends as determinants in animal production. (dr hab. inż. Mirosław Banaszak, prof. PBŚ)

| | | |
|---|---|---|
| **IV** | **15** | prof. dr hab. inż. Dariusz Boroński<br>prof. dr hab. inż. Maria Siwek-Gapińska<br>dr hab. inż. Magdalena Stanek, prof. PBŚ<br>dr hab. inż. Mirosław Banaszak, prof. PBŚ<br>dr hab. inż. Maciej Walkowiak, prof. PBŚ<br>prof. dr hab. inż. Anna Wenda-Piesik<br>dr inż. Piotr Kiedrowski |
| **dr hab. inż. Maciej Walkowiak, prof. PBŚ**<br><br>1. 5G and 6G networks<br>2. Internet of Things<br>3. Artificial intelligence<br>4. Spaceship or canoe – continuation of the discussion on cybersecurity<br>5. Electromagnetism in the cognition of man and the universe<br>6. Human interaction with electromagnetic fields<br>7. Electromagnetic compatibility as an element of ecology | | |
| **V** | **15** | prof. dr hab. inż. Dariusz Boroński<br>prof. dr hab. inż. Maria Siwek-Gapińska<br>dr hab. inż. Magdalena Stanek, prof. PBŚ<br>dr hab. inż. Mirosław Banaszak, prof. PBŚ<br>dr hab. inż. Maciej Walkowiak, prof. PBŚ<br>prof. dr hab. inż. Anna Wenda-Piesik<br>dr inż. Piotr Kiedrowski |
| **prof. dr hab. inż. Anna Wenda-Piesik**<br>7 meetings, each of which will discuss different issues of modern trends in engineering and technical sciences and in natural sciences on the basis of the latest reports from "Nature" (IF=38) and "Science" (IF=41), i.e. publications with the highest impact index in science. The topics will concern technology, the concept of know-how, in the development of civilization. The assumption of such a series is to track progress, hence the topics will be updated every year. | | |

## 3. TEACHING METHODS

sem. II lecture - 15 hours
sem. III lecture - 15 hours
sem. IV lecture - 15 hours
sem. V lecture - 15 hours.
multimedia lecture, discussion

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies<br>a) to the extent that allows for the revision of existing paradigms – global achievements, including theoretical foundations and general issues and selected |

| | |
|---|---|
| | specific issues, specific to the group of natural and engineering and technical disciplines |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies<br>b) main development trends in the groups of natural sciences and engineering-technical disciplines. Understands the relationships and dependencies of research problems of the disciplines represented in the doctoral school. |
| P8S_WK_a | Context – conditions, effects<br>a) fundamental dilemmas of modern civilization characteristic of the group of natural and engineering-technical disciplines |
| P8S_WK_b | Context – conditions, effects<br>b) economic, legal, ethical and other important determinants of scientific activity characteristic of the group of natural and engineering and technical disciplines |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) use knowledge from the group of natural and engineering and technical disciplines to creatively identify and formulate the goals and objects of scientific research |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Evaluations – a critical approach<br>a) critical evaluation of achievements within the group of natural and engineering and technical disciplines |
| P8S_KK_b | Evaluations – a critical approach<br>b) critically evaluate their own contribution to the development of the discipline against the background of the group of natural and engineering and technical disciplines |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | | | X | X |
| P8S_WG_b | | | | | X | X |
| P8S_WK_a | | | | | X | X |
| P8S_WK_b | | | | | X | X |
| P8S_UW_a | | | | | X | X |
| P8S_KK_a | | | | | X | X |
| P8S_KK_b | | | | | X | X |

## 6. LITERATURE

**Basic Literature**

**Semester II**

**prof. dr hab. inż. Dariusz Boroński**

1. K. T. Chau. Electric Vehicle Machines and Drives: Design, Analysis and Application. Wiley-IEEE Press, 2015. EBSCOhost, search.ebscohost.com/login.aspx?direct=true&db=edsebk&AN=993140&lang=pl&site=eds-live.
2. Bruce Usher. Renewable Energy: A Primer for the Twenty-First Century. Columbia University Press, 2019. EBSCOhost, search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=1946704&lang=pl&site=eds-live.
3. Messner, William C. Autonomous Technologies: Applications That Matter. SAE International, 2014.

EBSCOhost, search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=1805014&lang=pl&site=eds-live.
4. Herrmann, Andreas, et al. Autonomous Driving: How the Driverless Revolution Will Change the World. Emerald Publishing Limited, 2018. EBSCOhost, search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=1579295&lang=pl&site=eds-live.
5. George A Bekey, et al. Robotics: State Of The Art And Future Challenges. Imperial College Press, 2008. EBSCOhost, search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=516770&lang=pl&site=eds-live.
6. Zukas, Victoria, and Jonas A. Zukas. An Introduction to 3D Printing. First Edition Design Publishing, 2015. EBSCOhost, search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=1003128&lang=pl&site=eds-live.

**Semester III**
**prof. dr hab. inż. Maria Siwek-Gapińska**

1. Preeti A., and Misra G., eds. Omics Approaches, Technologies and Applications: Integrative Approaches for Understanding OMICS Data. Springer, 2019.
2. De Heus: Hulsen, Jan, and Kees Scheepens. Pig Signals: Look, Think and Act. Roodbont, 2006.
3. Pueyo Montesinos G. del.: Rehabilitacja i fizjoterapia w weterynarii. 2017. Elsevier Urban & Partner, Wrocław.
4. Pevsner J., Bioinformatics and functional genomics. 2015. Third edition. Chichester, West Sussex, UK : Wiley-Blackwell
5. Stryer L., Berg J.M, Tymoczo J.L. „Biochemia", 2018. Wyd. Nauk. PWN, Warszawa

**Semester IV**
**dr hab. inż. Maciej Walkowiak, prof. PBŚ**

1. Dott Annabel Z.: *Essential Guide to Telecommunication.* Pearson Education (US), 2018
2. Smith Kameron: *Telecommunications Essentials*. Clanrye International, 2019
3. Penttinen Jyrki T. J.: *5G Explained - Security and Deployment of Advanced Mobile Communications*. Wiley, 2019
4. *Smart Grid and Internet of Things*. Second EAI International Conference, SGIoT 2018, Niagara Falls, ON, Canada, July 11, 2018
5. Mohesen Guizani , Hsiao-Hwa Chen , Chonggang Wang: *The Future of Wireless Networks: Architectures, Protocols, and Services (Wireless Networks and Mobile Communications)*. CRC Press, 2015
6. Battocletti Joseph H.: *Electromagnetism, Man and the Environment*. Routledge, 2019
7. Clayton R. Paul: *Introduction to Electromagnetic Compatibility*. Wiley-Interscience; 2 edition, 2006

**Semester V**
**prof. dr hab. inż. Anna Wenda-Piesik**
Journal Science
Journal Nature

**Additional Literature**

**Semester II**
**prof. dr hab. inż. Dariusz Boroński**
- electronic sources available in the PBS Main Library

**Semester III**
**prof. dr hab. inż. Maria Siwek-Gapińska**

1. Bockstahler B., Levine D., Millis D.: Fizjoterapia psów i kotów. Rehabilitacja i zwalczanie bólu. 2004. Wyd. Galaktyka
2. Martin P., Bateson P. Measuring behaviour. An introductory guide. 2007. Cambridge University Press.
3. Margit H. Zeitler-Feicht. Zachowania koni. Przyczyny, terapia i profilaktyka. 2014. Świadome Jeździectwo, Warszawa.
4. Cattle behaviour. http://www.publish.csiro.au/ebook/chapter/9781486301614_Chapter4
5. Pig behaviour. https://www.farmhealthonline.com/health-welfare/pigs/pig-behaviour/
6. Animal Behaviour Net. https://www.animalbehaviour.net/
7. Adamczyk K., Górecka-Bruzda A., Nowicki J., Gumułka M., Molik E., Schwarz T., Earley B., Klocek C. 2015 – Perception in farm animals – a review. Annals of Animal Science 15, 565-589.
8. Temple Grandin. Zrozumieć zwierzęta. 2011. Media Rodzina, Poznań.
9. Levine D., Millis D.L., Taylor R.A.: Rehabilitacja psów. 2016. Edra Urban&Partner, Wrocław.
10. Robertson J., Mead A.: Fizjoterapia i masaż psów. 2017 Galaktyka, Łódź.
11. Kinalski R.: Neurofizjologia kliniczna dla neurorehabilitacji. Podręcznik dla studentów i absolwentów wydziałów fizjoterapii. 2008. Med Pharm Polska.
12. Minakowski W., Weidner S., „Biochemia kręgowców", Wyd. Nauk. PWN, Warszawa 2005.
13. Murray R.K., Granner D.K., Mayes P.A., Podwell V.W., „Biochemia Harpera", Wyd. Lek. PZWL, Warszawa 2016
14. Kączkowski J., „Podstawy biochemii", Wyd. Nauk. Techn., Warszawa 2017.
15. Kupcewicz B., Roślewska A., Stanek M., Stasiak K., „Materiały do ćwiczeń i seminariów z biochemii", Wyd. Uczelniane ATR, Bydgoszcz 2005.
16. Strzeżek J., Wołos A., 1997, „Ćwiczenia z biochemii", Wyd. ART Olsztyn
17. https://media.wholefoodsmarket.com/news/whole-foods-market-unveils-top-10-food-trends-for-2019
18. https://www.tysonfoods.com/the-feed-blog/food-trends-2019
19. http://www.mintel.com/global-food-and-drink-trends/
20. http://ptz.icm.edu.pl/wp-content/uploads/2011/12/PH_8_2011_Mlynarczyk.pdf
21. https://www.avec-poultry.eu/resources/annual-reports/
22. https://www.geografia24.eu/geo_prezentacje_rozsz_3/383_3_rolnictwo/r3_3_03a.pdf
23. http://www.fao.org/animal-production/en/

**Semester IV**
**dr hab. inż. Maciej Walkowiak, prof. PBŚ**
It will be provided on a regular basis, during classes

**Semester V**
**prof. dr hab. inż. Anna Wenda-Piesik**
It will be provided on a regular basis, during classes

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 7 |
| Item Name | **PREPARATION OF ARTICLES AND SCIENTIFIC PRESENTATIONS** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Beata Jędrzejewska, prof. PBŚ |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **III** | **15** | dr hab. inż. Beata Jędrzejewska, prof. PBŚ |
| Methods of searching for scientific information. Parametric tools for publications and authors, search engines for journals and scientific publications (Scopus, Web of Science, Google Scholar), Scientific Publishers, lists of scored journals.<br>Methods of promoting scientific activity – creating online profiles (e.g. ResearchGate, ResearcherID, Google Scholar, Web of Science, ORCID), conference presentations and posters.<br>Rules for preparing a multimedia presentation and poster – formal and technical requirements, data visualization. | | |
| **IV** | **15** | prof. dr hab. inż. Dariusz Piwczyński |
| The role of a scientific article; Objectives of publishing, types of scientific articles, selection of a journal.<br>Editorial preparation of a scientific article – technical requirements. Word processors, spreadsheets and visualizations, graphics programs, bibliography programs, chemical and mathematical formula editors.<br>Principles of intellectual property protection, including citing other works.<br>Rules for the preparation of a scientific publication – formal requirements. Structure of a scientific article; the way of writing individual elements of the article: title, abstract, theoretical introduction, research methodology, discussion and discussion of results, summary and conclusions, nomenclature, etc.<br>Sending the article to the journal and formalities after it has been accepted for printing. | | |

## 3. TEACHING METHODS

Sem. III lecture - 8 hours seminar - 7 hours
Sem. IV lecture - 8 hours seminar - 7 hours
A mixed form of classes combining a lecture and a seminar in both semesters; full-time and/or distance learning, synchronous and asynchronous; multimedia presentation; work on source materials

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_c | Scope and depth – completeness of cognitive perspective and dependencies<br>c) the methodology of scientific research in the field of methods of searching for scientific information, |
| P8S_WG_d | Scope and depth – completeness of cognitive perspective and dependencies<br>d) the rules for disseminating the results of scientific activity and promoting scientific activity in the form of scientific publications and presentations, also in the open access mode; |
| SKILLS: can | |
| P8S_UW_b | Knowledge use – problems solved and tasks performed<br>b) thanks to the knowledge of parametric tools of publications and authors, to critically analyze and evaluate the results of scientific research, expert activity and other creative works and their contribution to the development of knowledge |
| P8S_UK_b | Communication – receiving and creating statements, dissemination of knowledge in the scientific community<br>b) knowing the methods of preparing scientific presentations and articles, disseminate the results of scientific activity, also in popular forms |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_b | Evaluations – a critical approach<br>b) through the knowledge of parametric tools of publications and authors, critical assessment of their own contribution to the development of a given scientific discipline |
| P8S_KR_a | Professional role – independence and ethos development<br>a) maintain and develop the ethos of the research community through knowledge of the principles of citation and co-authorship in publications, understands the need to respect the principles of public ownership of the results of scientific activity, taking into account the principles of intellectual property protection. |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | … | … |
| P8S_WG_c | | | | X | | |
| P8S_WG_d | | | | X | | |
| P8S_UW_b | | | | X | | |
| P8S_UK_b | | | | X | | |
| P8S_KK_b | | | | X | | |
| P8S_KR_a | | | | X | | |

## 6. LITERATURE

| Basic Literature |
|---|
| **Semester III**<br>1. Wasylczyk P., 2017. Prezentacje naukowe. Praktyczny poradnik dla studentów, doktorantów i nie tylko. Wydawnictwo Naukowe PWN, Warszawa.<br>2. Zabielski R., Godlewski M. M., 2011. Przewodnik prezentowania informacji naukowej. Katedra Nauk Fizjologicznych Wydział Medycyny Weterynaryjnej SGGW, Warszawa.<br>3. https://epodreczniki.pl/a/tworzenie-prezentacji/DOPPeVhVM<br>4. Elektroniczne zasoby licencjonowane przez PBŚ oraz ogólnodostępne bazy danych i katalogów czasopism elektronicznych.<br>**Semester IV**<br>1. Liśkiewicz T., Liśkiewicz G., 2014. Wprowadzenie do efektywnego publikowania naukowego. Jak przygotować, wysłać i promować artykuł naukowy. Wydawnictwo AmberEditing, Łódź.<br>2. Siuda P., Wasylczyk P., Publikacje naukowe, 2018. Praktyczny poradnik dla studentów, doktorantów i nie tylko. Wydawnictwo Naukowe PWN, Warszawa.<br>3. Bieżące publikacje naukowe. |
| **Additional Literature** |
| 1. Hirsch J. E., 2005. An index to quantify an individual's scientific research output. Proc. Nat. Acad, Sci. (PNAS), vol. 102, nr 46, s. 16569-16572.<br>2. Kozierski P. Kabaciński R., Lis M., Kaczmarek P., 2013. Open Access. Analiza zjawiska z punktu widzenia polskiego naukowca. Wyd. Impuls, Poznań - Kraków.<br>**3.** Kulczycki E., 2013. Jak dodać prace do Google Scholar i zwiększyć liczbę cytowani oraz indeks Hirscha? Stowarzyszenie EBIB, Toruń. |

POLITECHNIKA BYDGOSKA
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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 8 |
| Item Name | **DATA ANALYSIS - STATISTICS, DATA VISUALISATION** |
| Course coordinator responsible for preparing the syllabus | prof. dr. hab. inż. Anna Wenda-Piesik |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **III** | **15*** | Disciplines of natural sciences<br>prof. dr. hab. inż. Anna Wenda-Piesik<br>prof. dr. hab. inż. Dariusz Piwczyński<br><br>Disciplines of engineering and technical sciences<br>dr hab. inż. Adam Lipski, prof. PBŚ<br>dr inż. Krzysztof Nowicki |

*- subject taught separately in a group of disciplines

**Semester III**

**Disciplines of natural sciences**
**prof. dr. hab. inż. Anna Wenda-Piesik**

1. Introduction to descriptive statistics for the sample and general population. Types of empirical distributions. Assumptions of the correctness of statistical analyses, data transformations.
2. The theory of parametric estimation and the practical application of estimators in natural research.
3. Theory and application of compatibility, randomness, and independence tests. Sample studies in terms of extreme data affiliation, uniformity of variance and normality of distribution.
4. Statistical inference methods for two populations. Diagram of the structure of the significance test, *the Student's t-test and its modifications.*
5. Stochastic relationship analyses (linear and nonlinear estimates) in two-dimensional populations.
6. Introduction to ANOVA, linear ANOVA models.
7. Graphical presentation of results from various studies in the life sciences.
8. Use of statistical packages: Statistica 13.0 and Excel spreadsheet for calculations.

**Disciplines of engineering and technical sciences**
**dr hab. inż. Adam Lipski, prof. PBŚ**

1. Object of research as a source of data. Basic methods of data presentation.
2. Descriptive statistics. Selected position and dispersion indicators.
3. Random variable. Selected discrete and continuous distributions. Random variable generation.
4. Statistical inference. Methods of determining estimators. Parametric estimation. Determination of the minimum sample size.
5. Testing statistical hypotheses. Selected statistical tests.
6. Analysis of the relationship between two quantitative variables. Correlation. Regression equation.

Confidence interval of the regression equation. Outliers and influential.
7. Application of statistical methods to quality assurance.
8. Selected information on stochastic processes.

| | | |
|---|---|---|
| **IV** | **30 E*** | prof. dr. hab. inż. Anna Wenda-Piesik<br>dr hab. inż. Adam Lipski, prof. PBŚ |

E - exam
*- subject taught separately in a group of disciplines

**Disciplines of natural sciences**
**prof. dr. hab. inż. Anna Wenda-Piesik**
1. Applications of multivariate exploratory techniques in the processing of data from natural experiments (genetics, breeding) – cluster analysis (CA), dendrograms, k-means method.
2. MANOVA in the development of agricultural data and multiple comparison tests from the *post-hoc group*.
3. Applications of principal components analysis (PCA) and factor analysis (FA) in the development of natural data.
4. Multiple regression analysis and cross-linking of data from environmental studies (screenings).
5. Methods of analysis of data from surveys. Selected methods of analysis of results expressed on a nominal and ordinal scale.
6. Nonparametric tests of chi2, T-Wilcoxon, Mann–Whitney U, measures of covariance V-Cramer, t-Kendall, r-Spearman.
7. Dyskimination analysis and canonical analysis. Statistical inference and substantive inference.

**Disciplines of engineering and technical sciences**
**dr inż. Krzysztof Nowicki**
1. Regressions – simple, multiple, stepwise, nonlinear, logistic, residual analysis.
2. Elements of experience planning.
3. Analysis of variance / covariance – univariate, multivariate, hierarchical, multivariate, repeated measurements, variational components.
4. Canonical Analysis
5. Discriminant analysis
6. Cluster analysis
7. Principal components analysis
8. Factor analysis
9. Log Line Analysis

## 3. TEACHING METHODS

sem. III lecture - 8 hours, laboratory classes - 7 hours.
sem. IV lecture - 15 hours, laboratory classes - 15 hours.
multimedia lecture, laboratory exercises, case method, data analysis based on statistical programs

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_c | Scope and depth – completeness of cognitive perspective and dependencies<br>c) the scopes of methods of descriptive and mathematical statistics and the presentation of results, which are used at an advanced level as tools for data analysis in natural sciences and engineering and technology. |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) use scientific knowledge in the field of data analysis and presentation to draw conclusions based on the results of scientific research, |
| P8S_UW_b | Knowledge use – problems solved and tasks performed<br>b) critically evaluate research hypotheses based on the results of scientific research |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_c | Evaluations – a critical approach<br>(c) recognising the importance of scientific knowledge in data analysis in solving cognitive and practical problems |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Project | … |
| P8S_WG_c | | X | | | | |
| P8S_UW_a | | | X | | X | |
| P8S_UW_b | | | X | | X | |
| P8S_KK_c | | | X | | X | |

## 6. LITERATURE

**Basic Literature**

**Semester III**

**Disciplines of natural sciences**

1. Wenda-Piesik A., Gałęzewski L. 2020. Kurs statystyki dla studentów kierunków przyrodniczych Uniwersytetu Technologiczno-Przyrodniczego w Bydgoszczy. S. 115, http://dlibra.utp.edu.pl/dlibra
2. Dawn Griffiths. Statystyka (tytuł w oryginale Head First Statistics). Wydawnictwo Helion S.A. Gliwice, 2010, liczba stron: 711.
3. Adam Łomnicki. Wprowadzenie do statystyki dla przyrodników, Wydawnictwo Naukowe PWN, Warszawa, wydanie 5, 2019 liczba stron: 245.
4. Mieczysław Sobczyk. Statystyka. Wydawnictwo Naukowe PWN, Warszawa, 5, 2020, liczba stron: 356.
5. Andrzej Luszniewicz, Teresa Słaby. Statystyka z pakietem komputerowym STTISTICA PL. Wydawnictwo C.H. Beck, 2008, liczba stron: 472.
6. Ryszard Błażejewski. Wstęp do badań empirycznych. Wydawnictwo Akademii Rolniczej w Poznaniu, Poznań 1999, liczba stron: 101.

**Disciplines of engineering and technical sciences**

1. Klonecki W., Statystyka dla inżynierów. PWN, Warszawa, 1999.
2. Hellwig Z., Elementy rachunku prawdopodobieństwa i statystyki matematycznej. PWN,

Warszawa, 1998.

**Semester IV**
**Disciplines of natural sciences**

1. Andrzej Stanisz, Przystępny kurs statystyki z zastosowaniem STATISTICA PL na przykładach z medycyny. Tom 1. Statystyki podstawowe, Wydawca: StatSoft Polska Wydanie: Kraków, 2006, number of pages: 532.
2. Andrzej Stanisz, Przystępny kurs statystyki z zastosowaniem STATISTICA PL na przykładach z medycyny Tom 2. Modele liniowe i nieliniowe, Wydanie: Kraków, 2007, number of pages: 868.
3. Andrzej Stanisz, Przystępny kurs statystyki z zastosowaniem STATISTICA PL na przykładach z medycyny Tom 3. Analizy wielowymiarowe, Wydanie: Wydanie: Kraków, 2007, number of pages: 500.
4. Franfort-Nachmias Ch., Nachmias D. 2002. Metody badawcze w naukach społecznych. Wydawnictwo Zysk i S-ka, Poznań, number of pages: 616.

**Disciplines of engineering and technical sciences**

1. Walesiak M., Gatnar E. (red.), Statystyczna analiza danych z wykorzystaniem programu R, Wydawnictwo naukowe PWN, Warszawa, 2012, number of pages: 468.

**Additional Literature**

**Semester III**
**Disciplines of natural sciences**

1. Meissner W. 2010. Przewodnik do ćwiczeń z przedmiotu. Metody statystyczne w biologii. W UG, Gdańsk
2. Gołaszewski J., Puzio-Idźkowska M., Stawiana-Kosiorek A., Załuski D. 2003. Statystyka dla przyrodników, Wyd. UWM, Olsztyn, number of pages: 265.
3. Sokal R, Rohlf. Biometry. W.H. Freeman and Company, New York, 1981, number of pages: 859.

**Disciplines of engineering and technical sciences**

1. Hyk W., Stojek Z., Analiza statystyczna w laboratorium badawczym. PWN, Warszawa, 2019.
2. Metcalfe A.V., Statistics in Engineering. A practical approach. Chapman & Hall, 1994.

**Semester IV**
**Disciplines of natural sciences**

1. Aneta Ptak-Chmielewska, Uogólnione modele liniowe, Oficyna Wydawnicza szkoła Głowna Handlowa w Warszawie, 2013, number of pages: 141.
2. Bill Shipley. Cause and correlation in Biology (A user's guide to path analysis, structural equations and causal inference). Cambridge University Press, Cambridge, 2000, number of pages: 318.
3. Norm O'Rourke, Larry Hatcher, Edward J. Stepanski. A step-by-step Approach to Using SAS for Univariate & Multivariate Statistics, SAS Institute, North Carolina, 2009, number of pages: 513.

**Disciplines of engineering and technical sciences**

1. Stanisz. A, Przystępny kurs statystyki, Tom 2 Modele liniowe i nieliniowe, StatSoft Polska, Kraków, 2007, number of pages: 867.
2. Stanisz. A, Przystępny kurs statystyki, Tom 3 Analizy wielowymiarowe, StatSoft Polska, Kraków, 2007, number of pages: 499.

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 9 |
| Item Name | **PHILOSOPHY OF COGNITION** |
| Course coordinator responsible for preparing the syllabus | dr Adam Skowron |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **V** | **10** | dr Adam Skowron |

1. Philosophy of cognition - preliminary issues, definitional problems. Cognition in science and philosophy.
2. The problem of the sources of cognition - genetic and methodological approach: empiricism, rationalism, irrationalism. A dispute over the object and limits of cognition.
3. The Question of Truth in Philosophy – Classical and Non-Classical Theories of Truth. Semantic definition of truth. Deflationism and anti-deflationism.
4. The development of methodological reflection in philosophy at the turn of the nineteenth and twentieth centuries – the problem of scientific cognition – philosophy of science. Concepts of K. Popper, Th. Kuhn, P.K. Feyerabend, Duhem-Quine coherenceism.
5. The main trends of contemporary epistemology: constructivism, postmodernism, neopragmatism, naturalism, anti-naturalism.

## 3. TEACHING METHODS

Lecture – 10 hours
multimedia lecture - discussion

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies:<br>a) to the extent that allows for the revision of existing paradigms – knows and understands the world's achievements, essence and conditions of problems specific to the philosophy of cognition |
| P8S_WG_c | Scope and depth – completeness of cognitive perspective and dependencies:<br>c) the history of the formation of the contemporary methodology of scientific research |
| P8S_WK_a | Context – conditions, effects:<br>a) fundamental dilemmas of modern civilization, including the problems of scientific cognition and the main directions of contemporary epistemology. |

| SOCIAL COMPETENCE: is ready to | |
|---|---|
| P8S_KK_c | Assessments – a critical approach:<br>c) through methodological reflection, recognition of the importance of knowledge in solving cognitive and practical problems |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | X | | | X | |
| P8S_WG_c | | X | | | X | |
| P8S_WK_a | | X | | | X | |
| P8S_KK_c | | X | | | X | |

## 6. LITERATURE

| **Basic Literature** |
|---|
| 1. Woleński J., 2005, Epistemologia. Poznanie, prawda, wiedza, realizm, Wydawnictwo Naukowe PWN, Warszawa.<br>2. Hetmański M. (red.), 2008, Epistemologia współcześnie, Universitas, Kraków.<br>Sady W., 2000, Spór o racjonalność naukową od Poincare`go do Laudana, Monografie Fundacji na rzecz Nauki Polskiej, Wrocław. |
| **Additional Literature** |
| 1. Heller M., 2011, Filozofia nauki. Wprowadzenie, Wydawnictwo Petrus, Kraków.<br>2. Morton A., 2002, Przewodnik po teorii poznania, Wydawnictwo Spacja, Warszawa. |

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 10 |
| Item Name | **ETHICS IN SCIENCE** |
| Course coordinator responsible for preparing the syllabus | dr Adam Skowron |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| **semester** | **hours** | **Host** |
|---|---|---|
| **V** | **5** | dr Adam Skowron |

Traditional and contemporary understanding of the university's mission and the ethos of science. The role of ethics in the twenty-first century pragmatics of scientific life.
Ethical neutrality and freedom of science (freedom of scientists) and the moral responsibility of the researcher, the scholar.
Institutionalization of ethics in science: Code of Ethics for Researchers, Good Practice in Scientific Research, Good Practices in Science, European Charter for Researchers.
Using research results as an ethical problem. Ethics in the face of civilizational challenges and threats resulting from new forms of organization and financing of research.

## 3. TEACHING METHODS

Lecture – 5 hours
multimedia lecture - discussion

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WK_b | Context – conditions, effects<br>b) economic (research financing), formal and legal and ethical (codes of ethics) determinants of scientific activity |
| SKILLS: can | |
| P8S_UW_b | Use of knowledge – problems solved and tasks performed:<br>b) perform a critical ethical analysis of the results of scientific research, expert activities and other creative works and assess their significance for the development of knowledge. |
| P8S_UU_a | Learning – planning your own development and the development of others:<br>a) independently plan and ethically implement their own scientific program and inspire and organize the development of others |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KO_a | Responsibility – fulfilling social obligations and acting for the public interest:<br>a) understanding the mission of the university and the ethos of science, fulfilling the social obligations faced by researchers and creators. |

| | |
|---|---|
| P8S_KO_b | Responsibility – fulfilling social obligations and acting for the public interest:<br>b) understanding the mission of the University and the ethos of science, initiating activities for the public interest |
| P8S_KR_a | Professional role – independence and ethos development:<br>a) maintaining and developing the ethos of research and creative communities, namely conducting scientific activity in an independent manner (freedom of scientists), respecting the principle of public ownership of the results of scientific activity, taking into account the principles of intellectual property protection |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WK_b | | | | | X | |
| P8S_UW_b | | | | | X | |
| P8S_UU_a | | | | | X | |
| P8S_KO_a | | | | | X | |
| P8S_KO_b | | | | | X | |
| P8S_KR_a | | | | | X | |

## 6. LITERATURE

**Basic Literature**

1. Chmielecka E., Jedlicki J., Rychard A. (red), 2005, Ideały nauki i konflikty wartości, IFiS PAN, Warszawa.
2. Galewicz Wł., 2009, Etyczne i prawne granice badań naukowych, Uniwersitas Kraków.
3. Morawski R. Z., 2011, Etyczne aspekty działalności badawczej w naukach empirycznych, Wydawnictwo UW Warszawa.

**Additional Literature**

1. Kodeks Etyki Pracownika Naukowego, 2017, Komisja do spraw etyki w nauce PAN, Warszawa.
2. Dobra Praktyka Badań Naukowych, Rekomendacje, 2004, Warszawa.

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 11.I |
| Item Name | **General elective subjects block**<br>**RESEARCH AND DEVELOPMENT IN ENTERPRISES** |
| Course coordinator responsible for preparing the syllabus | a person from the economic environment |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **V** | **15** | A person from an economic background |
| During the lectures, people representing companies operating within the disciplines represented in the Doctoral School will present research methods and development strategies of individual enterprises. | | |

## 3. TEACHING METHODS

Classes are held in the form of a lecture and a seminar.
Lecture – 8 hours
Seminar – 7 hours

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WK_c | Context – conditions, effects<br>c) basic principles of knowledge transfer to the economic sphere and commercialization of the results of scientific activity and know-how related to these results, within the disciplines represented in the doctoral school |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) use knowledge from the group of natural and engineering and technical disciplines to creatively identify, formulate and innovatively solve complex problems or perform research tasks in the economic environment |
| P8S_UW_c | Knowledge use – problems solved and tasks performed<br>c) transfer the results of scientific activity in the field of natural sciences and engineering and technology to the economic sphere |
| P8S_UK_b | Communication – receiving and creating statements, disseminating knowledge in the scientific community and using a foreign language |

| | |
|---|---|
| | b) disseminate the results of scientific activity, also in forms popular for the needs of the economic environment |
| P8S_UK_c | Communication – receiving and creating statements, disseminating knowledge in the scientific community and using a foreign language<br>c) initiate a debate in the economic environment |
| P8S_UO_a | Work organization – planning and teamwork<br>a) plan and implement individual and team research or creative projects in the economic environment |
| P8S_UU_a | Learning – planning your own development and the development of others<br>a) independently plan and act for their own development and inspire and organize the development of other people from the economic environment |
| P8S_UU_b | Learning – planning your own development and the development of others<br>b) plan classes or groups of classes and carry them out with the use of modern methods and tools of people from the economic environment |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KO_c | Responsibility – fulfilling social obligations and acting for the public interest<br>c) thinking and acting in an entrepreneurial way in cooperation with the economic environment |
| P8S_KR_a | Professional role – independence and ethos development<br>maintaining and developing the ethos of research and creative communities in the economic environment |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WK_c | | | | | X | |
| P8S_UW_a | | | | | X | |
| P8S_UW_c | | | | | X | |
| P8S_UK_b | | | | | X | |
| P8S_UK_c | | | | | X | |
| P8S_UO_a | | | | | X | |
| P8S_UU_a | | | | | X | |
| P8S_UU_b | | | | | X | |
| P8S_KO_c | | | | | X | |
| P8S_KR_a | | | | | X | |

## 6. LITERATURE

| **Basic Literature** |
|---|
| It will be provided on a regular basis, during classes |
| **Additional Literature** |

| |
|---|
| It will be provided on a regular basis, during classes |

POLITECHNIKA BYDGOSKA
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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 11.II |
| Item Name | **General elective subjects block**<br>**HIGHER SCHOOL DIDACTICS WITH ELEMENTS OF METHODOLOGY** |
| Course coordinator responsible for preparing the syllabus | dr Magdalena Zając |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **V** | **15** | dr Magdalena Zając |

Higher education as a science. The essence, issues and functions and its place among pedagogical sciences. Contemporary student - characteristics of Generation Z. Characteristics of early adulthood:
(theories: D. Levinson, R. Gould, E. Erikson). Young adults - psychophysical, cognitive, social, emotional and moral development; regularities and determinants of the learning process from adolescence to early adulthood, forms of adult activity. Expanding autonomy and self-reliance. Socialization and social position in a student group. The role of significant people and authorities – the teacher's authority. Ambitions and aspirations. Motivation. Specificity and regularities of learning in young adults. Cognitive styles and learning strategies vs. teaching styles in higher education. A modern academic teacher.
Qualifications, competences and the role of an academic teacher. Student-teacher interactions throughout the classroom. Student group dynamics: student collaboration and cooperation. Stimulating the cognitive activity of students, creating didactic situations, managing the work of students.

## 3. TEACHING METHODS

lecture, group discussion

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WK_c | Knows and understands:<br>The relationship between the quality of teaching at the university level and the effectiveness of the use of knowledge by students in their professional activities |
| SKILLS: can | |
| P8S_UW_a | Can:<br>Recognize the didactic situation in the context of the teacher-student relationship and plan interactions based on the results of scientific research in the humanities and social sciences |
| P8S_UW_c | Can<br>By means of didactic techniques, transfer the results of scientific activity to the economic and social sphere |
| P8S_UK_b | Can: |

| | |
|---|---|
| | In a manner consistent with the knowledge of the social sciences and humanities, formulate statements that allow for a wider dissemination of the results of scientific activity |
| P8S_UK_c | Can:<br>In a manner consistent with the knowledge in the field of social sciences and humanities, initiate and conduct a debate and discussion of the results of scientific activities |
| P8S_UO_a | Is able to plan and implement individual and team research or creative projects with the participation of university students, also in an international environment, in a manner worthy of the principles of didactics. |
| P8S_UU_a | Can independently design the path of his/her own professional development, also as a teacher, as well as the path of professional and scientific development of the student |
| P8S_UU_b | Is able to plan classes or groups of classes on the basis of knowledge in the field of humanities and social sciences and implement them using modern methods and tools |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KO_c | Is ready to self-reflect on their own professional development in the context of their environmental role |
| P8S_KR_a | Is ready to use universal ethical principles and standards in professional activity, |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WK_c | | | | | X | |
| P8S_UW_a | | | | | X | |
| P8S_UW_c | | | | | X | |
| P8S_UK_b | | | | | X | |
| P8S_UK_c | | | | | X | |
| P8S_UO_a | | | | | X | |
| P8S_UU_a | | | | | X | |
| P8S_UU_b | | | | | X | |
| P8S_KO_c | | | | | X | |
| P8S_KR_a | | | | | X | |

## 6. LITERATURE

| Basic Literature |
|---|
| Brzezińska A., Brzeziński J., Ewaluacja procesu kształcenia w szkole wyższej, Poznań, 2000.<br>Bereźnicki F., Zagadnienia dydaktyki szkoły wyższej, Szczecin 2009<br>Cottrell S., Podręcznik umiejętności studiowania, Poznań 2007;<br>Jaskot H.W. (red.), Wprowadzenie do pedagogiki szkoły wyższej, Szczecin 2006.<br>Michałowska D.A., Wartości w świecie edukacji na początku XXI wieku,Wyd. Naukowe WNS UAM, Poznań 2013.<br>Kubiak-Szymborska, E., Nauczyciele akademiccy – studenci. Między partnerstwem a pozorną stycznością, Bydgoszcz, 2005<br>Legowicz J., The University Teacher. Professional ethos and educational model, „Życie szkoły wyższej", R XXXIV, 1986, s. 155-173<br>Lewowicki T., Proces kształcenia w szkole wyższej, Warszawa 1988; |

Sitarska B., (red.), Jakość kształcenia w szkole wyższej moda czy konieczność? Siedlce 2000;
Szewczuk K., Metody dydaktyczne stosowane w szkole wyższej, Kraków 2013
Wykładowca doskonały. Podręcznik nauczyciela akademickiego, red. A. Rozmus, Warszawa 2010.

**Additional Literature**

Arends, R. (1994). Uczymy się nauczać. Warszawa.
Barnes, D. (2004) Nauczyciel i uczniowie. Od porozumiewania się do kształcenia. Warszawa.
L. B. Curzon, J. Tummons (2013) Teaching in further education – an outline of principles and practice, Bloomsbury Academic
Enkelmann N., Charyzma, Warszawa 2000;
Fenstermacher G., Soltis J., Style nauczania, Warszawa 2000
Gagne, R.M., Briggis, L.J., Wager, W.W. (1992). Zasady projektowania dydaktycznego.
Kwieciński Z., Śliwerski B. (red), Pedagogika. podręcznik akademicki 1 i 2, Warszawa 2003. PWN,
Mel, S. (2005) Uczymy się uczyć. Gdańsk:GWP
Mietzel, G. (2004). Psychologia kształcenia. Praktyczny podręcznik dla nauczycieli i pedagogów.
Morrison, K., Cohen, L. (1999). Wprowadzenie do nauczania. Poznań: wyd. Zysk i S-ka
Turner J., Helms D., Rozwój człowieka, Warszawa, 1999.

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 11.III |
| Item Name | **General elective subjects block**<br>**INFLUENCER MARKETING** |
| Course coordinator responsible for preparing the syllabus | dr Kinga Krupcała |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **V** | **15** | dr Kinga Krupcała |

Lectures:
1. Online marketing – 2 hours
2. Influencer marketing – 2 hours

Project exercises:
1. Content marketing in relation to the presentation of scientific research – 2 hours
2. Scenery and the language of benefits, H2H – 3 hours
3. AIDA model – 3 hours
4. Sales matrices "re-framing", "Martin Luther King", "4P" – 3 hours

## 3. TEACHING METHODS

lecture (4 hours) - multimedia presentation combined with discussion, project exercises (11 hours) on writing texts on the web - preparation of a project from the exercises - running a channel on a selected social media platform (LinkedIn, FB, IG)

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WK_c | Context – conditions, effects<br>c) basic principles of commercialization and promotion of the results of scientific activity in contemporary media<br>c) basic marketing methods for the promotion of scientific research |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) use knowledge on promoting the results of scientific activity to solve problems in an innovative way or perform tasks in the economic environment with the use of influencer marketing methods |
| P8S_UW_c | Knowledge use – problems solved and tasks performed |

| | |
|---|---|
| | c) promote and transfer the results of scientific/research activities to the sphere of electronic economy and the social sphere |
| P8S_UK_b | Communication – receiving and creating statements, disseminating knowledge in the scientific community and using a foreign language<br>b) promote the results of scientific activity, including in popular forms including social media |
| P8S_UK_c | Communication – receiving and creating statements, disseminating knowledge in the scientific community and using a foreign language<br>c) initiate a debate on the results of research activities in the economic environment<br>c) encourage the public to learn about new and interesting research results |
| P8S_UO_a | Work organization – planning and teamwork<br>a) plan and implement individual and team research projects, taking into account the promotion of research results,<br>a) prepare interesting and eye-catching texts promoting scientific activity |
| P8S_UU_a | Learning – planning your own development and the development of others<br>a) independently plan and act for their own development and inspire and organize the development of others in the field of science marketing<br>a) promote their own (or the team's) scientific activities in an interesting way (as it were, in a way of sales) |
| P8S_UU_b | Learning – planning your own development and the development of others<br>b) plan classes or groups of classes and carry them out with the use of modern methods and tools in the field of science marketing |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KO_c | Responsibility – fulfilling social obligations and acting for the public interest<br>c) think and act in an entrepreneurial way in the field of science marketing |
| P8S_KR_a | Professional role – independence and ethos development<br>a) promoting the results of scientific activity, maintaining and developing the ethos of research and creative communities,<br>a) disseminate the latest scientific achievements in contemporary media in a way that interests the audience |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WK_c | | x | | | | |
| P8S_UW_a | | | | x | | |
| P8S_UW_c | | | | x | | |
| P8S_UK_b | | | | | x | |
| P8S_UK_c | | | | | x | |
| P8S_UO_a | | | | x | | |
| P8S_UU_a | | | | x | | |
| P8S_UU_b | | | | x | | |
| P8S_KO_c | | | | x | | |
| P8S_KR_a | | | | x | | |

## 6. LITERATURE

| Basic Literature |
| --- |
| 1. Cook M.J., Instagram Influencer Marketing Adversiting 2021, Wyd. Unlucky LTD, 2020<br>2. Glenister G., Influencer Marketing Strategy, Wyd. Kogan Page, 2021<br>3. Hennessy B., Influencer, Wyd. Dark Horse Comics,U.S., 2018<br>4. Jagiello M., Złote zasady marketingu online, Wyd. Artekaft, 2018<br>5. Stopczyńska K., Influencer marketing w dobie nowych mediów, Wyd. Uniwersytetu Łódzkiego, Łódź 2021 |
| **Additional Literature** |
| 1. Meerman S.D., Nowe zasady marketingu i PR, Wyd, Oficyna, 2009 |

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 11.IV |
| Item Name | **General elective subjects block**<br>**SOFT SKILLS IN PRACTICE** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Witold Hołubowicz, prof. PBŚ |

## 1. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **V** | **15** | dr hab. inż. Witold Hołubowicz, prof. PBŚ |
| The following issues are discussed:- negotiations- effective action<br>- the job search process<br>- oral and written communication | | |

## 2. TEACHING METHODS

Lecture – 15 hours

- Lecture with presentation
- Training videos
- Analysis of TED presentations related to the subject of the subject
- Negotiation training game
- Summary seminar

## 3. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WK_c | Context – conditions, effects<br>c) basic principles of communication and transfer of knowledge to the economic and social sphere |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) use knowledge and apply soft skills to creatively and effectively identify, formulate and innovatively solve complex problems or perform research tasks |
| P8S_UW_c | Knowledge use – problems solved and tasks performed |

| | |
|---|---|
| | c) transfer the results of scientific activity to the economic and social sphere using soft skills |
| P8S_UK_b | Communication – receiving and creating statements, disseminating knowledge in the scientific community and using a foreign language<br>b) disseminate the results of scientific activity, also in popular forms using soft skills |
| P8S_UK_c | Communication – receiving and creating statements, disseminating knowledge in the scientific community and using a foreign language<br>c) initiate debate, communicate and negotiate |
| P8S_UO_a | Work organization – planning and teamwork<br>a) plan and implement individual and team creative projects, also in an international environment, using soft skills |
| P8S_UU_a | Learning – planning your own development and the development of others<br>a) independently plan and act for their own development and inspire and organize the development of others, using soft skills |
| P8S_UU_b | Learning – planning your own development and the development of others<br>b) plan classes or groups of classes and carry them out with the use of modern methods and tools, using soft skills |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KO_c | Responsibility – fulfilling social obligations and acting for the public interest<br>c) think and act in an entrepreneurial and effective manner |
| P8S_KR_a | Professional role – independence and ethos development<br>maintaining and developing the ethos of research and creative environments, using soft skills |

## 4. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WK_c | | | x | | | |
| P8S_UW_a | | | | | x | |
| P8S_UW_c | | | x | | | |
| P8S_UK_b | | | | | x | |
| P8S_UK_c | | | | | x | |
| P8S_UO_a | | | | | x | |
| P8S_UU_a | | | | | x | |
| P8S_UU_b | | | | | x | |
| P8S_KO_c | | | | | x | |
| P8S_KR_a | | | | | x | |

## 5. LITERATURE

| Basic Literature |
|---|

1. E. Bonneau, „O zachowaniu się w pracy”, Warszawa 2000
2. S.Covey, „7 nawyków skutecznego działania”, Poznań 2003
3. M.C.Donaldson, M.Donaldson, „Negocjacje”, Warszawa 1999

**Additional Literature**

1. H-G. Schnitzer, „Poradnik współczesnego savoir-vivru”, Warszawa 1998
2. B.Lunden, L.Rosell, „Techniki negocjacji. Jak odnieść sukces w negocjacjach.wyd.3, Opole 2003

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 11.V |
| Item Name | **General elective subjects block**<br>**OWN BUSINESS OR WORK IN A CORPORATION – WHICH IS BETTER?** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Witold Hołubowicz, prof. PBŚ |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **V** | **15** | dr hab. inż. Witold Hołubowicz, prof. PBŚ |
| LECTURE: First contact with business. Assessment of whether you are suitable for business. Finding a niche in the market. Turn ideas into plans. The role of business model uniqueness. Organizational forms of your own company Finance: costs, liquidity and profitability. External financing. Avoiding failure in business. Business risk management. The operation of corporations and large institutions.<br>SEMINARS: a case study of selected companies operating in Poland and abroad. Real-world examples of third-party funding applications. Are corporations toxic – discussion. A training game on business. Analysis of TED presentations related to the subject of the subject. Team Management Workshop | | |

## 3. TEACHING METHODS

Lecture (8 hours)
Seminars (7 hours)

- Lecture with presentation
- Training videos
- Analysis of TED presentations related to the subject of the subject
- Team Management Workshop
- Business Training Game

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WK_c | Context – conditions, effects<br>c) basic principles of knowledge transfer to the company and commercialization of the results of scientific activity in business |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed |

| | |
|---|---|
| | a) use knowledge about the company's activities to creatively identify, formulate and innovatively solve complex problems or perform research tasks in the company |
| P8S_UW_c | Knowledge use – problems solved and tasks performed<br>c) knowing the business specifics of the company, transfer the results of scientific activity to the economic and social sphere |
| P8S_UK_b | Communication – receiving and creating statements, disseminating knowledge in the scientific community and using a foreign language<br>b) knowing the business specifics of the company, disseminate the results of scientific activity, also in popular forms |
| P8S_UK_c | Communication – receiving and creating statements, disseminating knowledge in the scientific community and using a foreign language<br>c) initiate a debate with employees of cooperating companies |
| P8S_UO_a | Work organization – planning and teamwork<br>a) plan and implement individual and team research or creative projects, also in the business environment |
| P8S_UU_a | Learning – planning your own development and the development of others<br>a) independently plan and act for their own development and inspire and organize the development of others in the business environment |
| P8S_UU_b | Learning – planning your own development and the development of others<br>b) plan classes or groups of classes for the company's employees and carry them out with the use of modern methods and tools |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KO_c | Responsibility – fulfilling social obligations and acting for the public interest<br>c) think and act in an entrepreneurial way in contacts with business |
| P8S_KR_a | Professional role – independence and ethos development<br>maintaining and developing the ethos of research and creative communities in business environments |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | … |
| P8S_WK_c | | | x | | | |
| P8S_UW_a | | | | | x | |
| P8S_UW_c | | | x | | | |
| P8S_UK_b | | | | | x | |
| P8S_UK_c | | | | | x | |
| P8S_UO_a | | | | | x | |
| P8S_UU_a | | | | | x | |
| P8S_UU_b | | | | | x | |
| P8S_KO_c | | | | | x | |
| P8S_KR_a | | | | | x | |

## 6. LITERATURE

| Basic Literature |
| --- |
| 1. I. Bogaczyk, B. Krupski, H. Lubińska, "Własna firma. Zakładanie I prowadzenie działalności gospodarczej", Wyd. Forum 2011<br>2. G. Biesok, J. Wyród-Wróbel, "Człowiek w organizacji", Wyd CeDeWu 2019<br>3. I. Kamińska-Radomska, "Kultura biznesu", PWN 2011 |
| **Additional Literature** |
| 1. M. Urbanek, "99 dni pracy w korporacji", Wyd. EMKA, 2010<br>2. R. Kapuściński, „Cesarz", Wyd. Czytelnik, 2019 |

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 11.VI |
| Item Name | **General elective subjects block**<br>**INVENTION TECHNIQUES** |
| Course coordinator responsible for preparing the syllabus | dr inż. Ilona Pyszka |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **V** | **15** | Ilona Pyszka, PhD<br>Piotr Wojewódzki, Ph.D. |
| Innovation (concepts and types). Inventions and patents. Description of the invention. The title of the invention. Definition of the field of invention technology. Description of the invention technique. Determination of the disclosure of the invention. Beneficial effects of the invention. Explanation of the figures of the invention. An example of the implementation of an invention. Application of the invention. Patent claims. Summary of the description of the invention. A necessary drawing. Selected issues from the procedure of examining invention applications and assessing the patentability of an invention. Utility model and industrial design and trademark. Patent Information. | | |

## 3. TEACHING METHODS

A mixed form of classes. Part of the content is carried out in the form of lectures (8 hours), and part in the form of a seminar – discussion, presentation (7 hours).

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WK_c | Context – conditions, effects<br>c) basic principles of creating and filing patent applications for an invention or utility model and implementing them into the economic sphere. |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) use knowledge in the field of invention technology to creatively identify, formulate and innovatively create inventions and patents, and in particular: define the purpose and subject of a patent application, formulate the title of the invention, description of the invention technique and patent claims. |
| P8S_UW_c | Knowledge use – problems solved and tasks performed<br>c) implement new or significantly improved product, process, marketing or organizational solutions into its business activity. |
| P8S_UK_b | Communication – receiving and creating statements, disseminating knowledge in the scientific community and using a foreign language<br>b) disseminate the results of scientific activity in the form of filing a patent application. |

| | |
|---|---|
| P8S_UK_c | Communication – receiving and creating statements, disseminating knowledge in the scientific community and using a foreign language<br>c) initiate discussion in the inventive environment. |
| P8S_UO_a | Work organization – planning and teamwork<br>a) plan and implement individual and team research projects. To look for creative solutions to defined problems. |
| P8S_UU_a | Learning – planning your own development and the development of others<br>a) independently plan and act for their own development. Develop the ability to think creatively and inspire and organize the development of others. |
| P8S_UU_b | Learning – planning your own development and the development of others<br>b) plan classes or groups of classes and carry them out using modern innovative methods. |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KO_c | Responsibility – fulfilling social obligations and acting for the public interest<br>c) think and act in an innovative way. |
| P8S_KR_a | Professional role – independence and ethos development<br>maintaining and developing the ethos of research and creative communities, including: conducting scientific activity in an independent manner, respecting industrial property rights, copyright and business secrets, taking into account the principles of intellectual property protection |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WK_c | | | | X | | |
| P8S_UW_a | | | | X | | |
| P8S_UW_c | | | | X | X | |
| P8S_UK_b | | | | X | X | |
| P8S_UK_c | | | | X | X | |
| P8S_UO_a | | | | X | X | |
| P8S_UU_a | | | | X | X | |
| P8S_UU_b | | | | X | X | |
| P8S_KO_c | | | | X | | |
| P8S_KR_a | | | | X | | |

## 6. LITERATURE

| **Basic Literature** |
|---|
| 1. Red. Pyrża A, Warszawa 2017. Poradnik wynalazcy. Urząd Patentowy Rzeczpospolitej Polskiej.<br>2. Oprac. Sychowska H., Warszawa 2017. Teksty ujednolicone podstawowych aktów wykonawczych do ustawy Prawo własności przemysłowej. Urząd Patentowy Rzeczpospolitej Polskiej.<br>3. Oprac. Sychowska H., Warszawa 2016. Prawo własności przemysłowej. Ustawa z dnia 30 czerwca 2000 r. Urząd Patentowy Rzeczpospolitej Polskiej |
| **Additional Literature** |

1. Bulletin of the Patent Office.
2. Patent Office News.

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 11.VII |
| Item Name | **General subjects to choose from: KNOWLEDGE MANAGEMENT IN SCIENCE AND BUSINESS** |
| Course coordinator responsible for preparing the syllabus | dr inż. Wojciech Żarski |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **V** | **15** | dr hab. inż. Waldemar Bojar |

Lecture 1. Basic definitions and concepts of knowledge. Typology of knowledge.
Lecture 2. Models of knowledge management.
Lecture 3. Knowledge engineering. Tools, techniques, and methods in Decision Support Systems (DSS).
Lecture 4. Mathematical models in decision support systems. Predict outcomes using simulation experiments.
Lecture 5. Strategies for designing SWD.
Lecture 6. User interface – modern standards and requirements.
Lecture 7. Implementation and use of knowledge management systems in the enterprise.
Lecture 8. A knowledge management system supporting the technological preparation of production.
Lecture 9. Knowledge mapping in B+R organizations as an element of the innovation process (case studies).
Lecture 10. Artificial intelligence (AI) – classification and application of AI methods.
Lecture 11. Examples of tools used in decision support systems: elements of the SQL language, decision rules, decision tables, scenarios.
Lecture 12. Discovering knowledge from data (OLAP, OLTP, Data Mining).
Lecture 13. Definitions and applications of Business Intelligence and Big Data.
Lecture 14. Definition and construction of an expert system and applications.
Lecture 15. Knowledge management in the AGRICORE project, Horizon 2020'.

## 3. TEACHING METHODS

Multimedia and interactive lecture

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WK_c | After completing the course, the doctoral student knows and understands the definitions and essence of knowledge as well as knowledge management in the context of the principles of creating, transferring and using knowledge in the economic and social spheres. |
| SKILLS: can | |

| | |
|---|---|
| P8S_UW_a | After completing the subject, the doctoral student is able to use knowledge from various fields of science to creatively identify, formulate and innovatively solve complex problems related to knowledge management. |
| P8S_UW_c | After completing the course, the doctoral student is able to extract knowledge from data with the help of the methods and tools learned in the field of critical analysis and evaluation of expert activity and other creative work in the context of solving problems in organizations with the help of the accumulated knowledge. |
| P8S_UK_b | After completing the subject, the doctoral student is able to disseminate the results of scientific activity, also in popular forms. |
| P8S_UK_c | After completing the subject, the doctoral student is able to initiate a debate on the issues of knowledge management. |
| P8S_UO_a | After completing the subject, the doctoral student is able to plan and implement individual and team research projects in the field of knowledge management. |
| P8S_UU_a | After completing the subject, the doctoral student is able to independently plan and act for their own development as well as inspire and organize the development of others. |
| P8S_UU_b | After completing the subject, the doctoral student is able to plan classes and implement them using modern methods and tools. |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KO_c | After completing the subject, the doctoral student is ready to think and act in an entrepreneurial way. |
| P8S_KR_a | After completing the subject, the doctoral student takes a critical approach to the acquired and used knowledge, respecting the principles that build the ethos of research and creative environments, m.in. taking into account the principles of intellectual property protection. |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WK_c | | | | | x | |
| P8S_UW_a | | | | x | x | |
| P8S_UW_c | | | | x | x | |
| P8S_UK_b | | | | | x | |
| P8S_UK_c | | | | | x | |
| P8S_UO_a | | | | | x | |
| P8S_UU_a | | | | | x | |
| P8S_UU_b | | | | | x | |
| P8S_KO_c | | | | | x | |
| P8S_KR_a | | | | | x | |

## 6. LITERATURE

| Basic Literature |
| --- |
| Bojar W., Duda J. 2017. Systemy wspomagania decyzji. Zarządzanie wiedzą produkcyjną. 2017. [W:] Inżynieria produkcji. Kompendium wiedzy / red. Ryszard Knosala wydawniczy: Warszawa: Polskie Wydawnictwo Ekonomiczne, 2017.<br><br>Kelm M. Mapowanie wiedzy w organizacjach B+R jako element procesu innowacyjnego. Śląska Wyższa Szkoła Zarządzania im. gen. J. Ziętka w Katowicach, Katedra Zarządzania, https://docplayer.pl/18259410-Mapowanie-wiedzy-w-organizacjach-b-r-jako-element-procesu-innowacyjnego.html, dostęp: 16. 05 2023.<br>Patalas-Maliszewska J. 2013. Model zarządzania wiedzą w polskich przedsiębiorstwach produkcyjnych [W:] Monografia pod red. Katarzyny Rostek pt. „ Zarządzanie wiedzą w tworzeniu przewagi konkurencyjnej", Wydział Zarządzania Politechniki Warszawskiej, Warszawa, s. 189-198. |
| **Additional Literature** |
| Goh A.L.S. 2005. Harnessing knowledge for innovation: an integrated management framework , „Journal of Knowledge Management", vol. 9, nr 4, s. 6-18.<br>Zarządzanie wiedzą. 2012. Trajer J., Paszek A., Iwan S. , PWE, Warszawa. Pod red. Z. Bubnickiego, A. Grzecha, 2003. Inżynieria wiedzy i systemy ekspertowe. T. 1. Oficyna Wydaw. Politechniki Wrocławskiej, Wrocław.<br>Yakhlef A. 2005. Immobility of tacit knowledge and the displacement of the locus of innovation , European Journal of Innovation Management, vol. 8, nr 2, s. 227-239. |

POLITECHNIKA BYDGOSKA
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HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 11.VIII |
| Item Name | **General elective courses:**<br>**CONDUCTING INNOVATIVE PROJECTS** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Bogdan Lent, prof. PBŚ |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **V** | **15** | dr hab. inż. Bogdan Lent, prof. PBŚ |

The maximum number of people taking part in the classes is 12 people.
Classes are held in two blocks with a break of min. 4 weeks, during which students perform an individual analysis of their own Work&Life Balance and a practical project together in groups of 2-3 people.

**Week One:**

Classes are conducted in 3 blocks of 180 minutes a day (4 lesson hours)
The theoretical introduction (120 minutes) is immediately followed by project classes aimed at developing the ability to apply the acquired theoretical knowledge and critical self-reflection (60 minutes).

Block 1:

**Project management as a cyber system**

- Project features
- Cybernetics
- Project according to ISO21500:2021
- Project management processes
- I, II and III-order cybernetics in project management
- Corrective and adaptive feedback
- Self-reflection on one's own experiences

**Intuition and emotions in running a project**

- Leadership in research and innovation projects
- Dimensions of risk management decisions in projects
- Intelligent decisions
- Trends in the decision-making process of project management
- Cognition and decision-making in our brain
- Intuition and factors limiting the effectiveness of intuition
- Design and Reflections

**Application of knowledge from block 2 in a selected project of students (Teams of 2-3 people)**

- Intuitive evaluation of proposed project ideas
- Reflections on the impact of projects and their environment on the implementation of projects in the implementation of the proposed projects.

Block 2:

**Defining the purpose of the research project and the innovation project**

- What is a research project?
- What is an innovation project?
- Defining the purpose of the research project and the innovation project
- Demarcation for research purposes
- Rubicon model of project phases
- Tools and roles useful in an innovation project
- Work breakdown structure and project components
- Project organization
- Application of knowledge to selected team projects; Reflections

**Managing administrative processes in project management**

- Investments in research and innovation projects
- Project progress control
- Earned Value Analysis
- Milestone trend analysis
- Managing the process of solving problems and risks
- Change process management, integration, knowledge and documentation in the project
- Integral Project Evaluation (Balanced Score Card)
- Application of knowledge to selected team projects; Reflections

**Application of knowledge from block 2 in a selected project of students (Teams of 2-3 people)**

- Consolidate the description of the project goal and organization
- Development of rules for integration and cultivation of social capital in the project
- Preparation of content for development in relation to the team project.
- Consolidation of decisions to implement administrative processes in selected projects
- Developing a plan for the team's work in the period for presentation in the second week of classes

Block 3:

**Management in collaboration projects, e.g. with other research centres**

- What is a Collaboration project?
- Cooperation project: project or programme?
- Social capital as a success factor for a cooperation project
- Levels of relationships between participants in a cooperation project
- Cultural influences
- Lead a cooperation project
- Managing personal matters in a project
- Influence of personality, MBTI taxonomy
- Formal and informal roles
- The Tuckman Cycle
- Application of knowledge to selected team projects; Reflections

**The Human Factor in Project Management - Conflict Resolution Management**

- What is conflict?

- Potential and symptoms of conflicts
- Cooperative conflict resolution
- Principles of avoiding conflicts and seeking solutions
- Conflict prevention
- Crisis management.
- Application of knowledge to selected team projects; Reflections

**The Human Factor in Project Management - Information and Marketing Management**

- Cybernetics of communication
- Communication with stakeholders in the project (Stakeholder) and knowledge in collaborative projects
- Communication in information and marketing
- Basic rules of communication
- Project Communication Planning
- Transactional Analysis
- Preferred Personality Communication Techniques Myers-Briggs-Typenindikator MBTI
- The impact of informal roles on effective communication
- Non-verbal communication
- Special ways of communication for project leaders.
- Application of knowledge to selected team projects; Reflections

**The human factor in project management - the development of one's own personality RWO**

- Skills required in the labour market
- Happiness and satisfaction with life according to Santos (Yale) and IKIGAI
- The Relation Between Wealth and Happiness
- Preparation for individual work for the last block (week two)
    - Individual analysis of your own typical day.
    - Stress, SRRS scale, analysis of own determinants
    - Daily cycle
    - SWOT in-house analysis
    - Formulating Life Goals
    - Eisenhower and Pareto/ABC priorities
    - Managing your own time
    - Thieves of time

**Application of knowledge from block 3 in a selected project of students (Teams of 2-3 people)**

- Consolidation of strategies in team management and conflict resolution in selected projects
- Preparation of content for development in relation to the team project.

**Period of development of the group project and preparation of the presentation:**

Min. 4 weeks. Estimated workload of each student: approx. 20-30 hours in total.

**Second week** (min. 4 weeks after the first week of classes):

The classes include 1 block (3 lesson hours) of joint reflections on the analysis of one's own goal

and time management, project presentations and reflections of the class participants.

Block 4:

**Own conclusions, reflections and meta-cognition from practice in conducting innovative projects**

- Reflections after analyzing your own goal and time management
- Presentation of the results of the work in the group projects
- Presentation of experiences and own conclusions, reflections and meta-cognition from the implementation of the selected phase of the project.
- Verification of the ability to apply and self-criticize the acquired knowledge
- Joint discussion of the participants.

## 3. TEACHING METHODS

Traditional methods used:
discussion and multimedia lecture, work with the system in the laboratory, project classes, discussion, case analysis method, project implementation, joint teamwork, development of reflections from observation, discussion, metacognition.

Distance learning methods used:

- Synchronous method in Teams of project implementation consultations
- Asynchronous method: Online educational videos, multimedia presentations played on-line.

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: Knows and understands:<br>P8S_WK: Context – conditions, effects | |
| P8S_WK_c | basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to these results |
| SKILLS: can<br>P8S_UW: Leveraging knowledge – problems solved and tasks performed | |
| P8S_UW_a | use knowledge from various fields of science or the field of art to creatively identify, formulate and innovatively solve complex problems or perform research tasks, and in particular: define the purpose and object of scientific research, formulate a research hypothesis, develop research methods, techniques and tools and creatively apply them, draw conclusions based on the results of scientific research. |
| P8S_UW_c | transfer the results of scientific activity to the economic and social sphere |
| SKILLS: can | |

| | |
|---|---|
| P8S_UK: Communication – receiving and creating statements, disseminating knowledge in the scientific community and using a foreign language | |
| P8S_UK_b | disseminate the results of scientific activity, also in popular forms |
| P8S_UK_c | initiate debate |
| SKILLS: can<br>P8S_UO: Work organization – planning and teamwork | |
| P8S_UO_a | plan and implement individual and team research or creative projects, also in an international environment |
| SKILLS: can<br>P8S_UU: Learning – planning your own development and the development of others | |
| P8S_UU_a | independently plan and act for their own development and inspire and organize the development of others |
| P8S_UU_b | plan classes or groups of classes and carry them out using modern methods and tools |
| SOCIAL COMPETENCE: is ready to<br>P8S_KO: Responsibility – fulfilling social obligations and acting for the public interest | |
| P8S_KO_c | thinking and acting in an entrepreneurial way |
| SOCIAL COMPETENCE: is ready to<br>P8S_KR: Professional role – independence and ethos development | |
| P8S_KR_a | maintaining and developing the ethos of research and creative communities, including: conducting scientific activity in an independent manner, respecting the principle of public ownership of the results of scientific activity, taking into account the principles of intellectual property protection |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Execution of RWO tasks | Presentation | Discussion | Development of the project phase |
| P8S_WK_c | | | | x | x | x |
| P8S_UW_a | | | | x | x | x |
| P8S_UW_c | | | | x | x | x |
| P8S_UK_b | | | | | x | |
| P8S_UK_c | | | | x | x | |
| P8S_UO_a | | | x | x | x | x |
| P8S_UU_a | | | x | x | x | x |
| P8S_UU_b | | | x | x | x | x |
| P8S_KO_c | | | x | x | x | |
| P8S_KR_a | | | x | x | x | |

## 6. LITERATURE

| Basic Literature |
|---|

1. Lent B, 2013, Cybernetic Approach to Project Management, Springer, 1-426
2. Rządowe Biuro Monitorowania Projektów (RBMP), 2021, Zarządzanie projektami strategicznymi: Rekomendacje, Kancelaria Prezesa Rady Ministrów (KPRM), 1-72
3. RBMP, 2021, Zarządzanie programami strategicznymi: Rekomendacje, KPRM, 1-64
4. RBMP, 2020, Przewodnik po zarządzaniu. Praktyczne wskazówki dla zarządzających programami i projektami, KPRM, 1-205
5. ISO, 2021, ISO 21500:2021, Project, programme and portfolio management — Context and concepts, 1-12
6. Lent B. 2005, Zarządzanie procesami prowadzenia projektów. Informatyka i Telekomunikacja, Difin, 1-420

**Additional Literature**

1. Leybourne A, Sadler-Smith E, 2006, The role of intuition and improvisation in project management, Intl. Journal of Project Management, V24, Issue 6, August 2006, 483-492
2. Marquardt K, 2009, Vom Umgang mit Komplexität in Projekten, www.kmarquardt.de
3. Turner JR, Anbari F, Bredillet Chr, 2013, Perspectives on Research in Project Management: The Nine Schools , Glob Bus Perspect (2013), 1: 3-28
4. Hofstede G, Minkov M, 2015, Cross-Cultural Research, Sage Publications, Vol. 48(2), 144-176

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HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 11.IX |
| Item Name | **General subjects to choose from:**<br>**SURFACE TESTING METHODS** |
| Course coordinator responsible for preparing the syllabus | dr inż. Marek Trzcinski |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| Semester | hours | Host |
|---|---|---|
| **VI** | **15** | Dr inż. Marek Trzciński |
| Surface structure, ideal and real surfaces. Straight and reverse surface network, surface defects. Preparation of atomically smooth surfaces. Diffractive methods for the study of surface structure (LEED / RHEED). Analysis of surface composition and chemical state using electron spectroscopy (ESCA/AES). High-resolution surface topography studies using scanning probe microscopy (SPM). Ionic surface testing and modification techniques (SIMS / FIM / FIB). | | |

## 3. TEACHING METHODS

| |
|---|
| Multimedia lecture<br>15 hrs |

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WK_c | **Context – conditions, effects**<br>c) basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to these results in the field of surface research and phenomena |
| SKILLS: can | |
| P8S_UW_a | **Knowledge use – problems solved and tasks performed**<br>a) use knowledge in the field of surface physicochemistry to creatively identify, formulate and innovatively solve complex problems or perform research tasks, draw conclusions based on the results of scientific research |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KR_a | **Professional role - independence and ethos development**<br>conducting scientific activity in an independent manner, respecting the principle of public ownership of the results of scientific activity |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | … |
| P8S_WK_c | | | × | | × | |
| P8S_UW_a | | | × | | × | |
| P8S_KR_a | | | | | × | |

## 6. LITERATURE

| **Basic Literature** |
|---|
| **1.** J.C. Vickerman, *Surface Analysis - The Principal Techniques*, John Wiley & Sons 2009<br>**2.** D. Briggs, M.P. Seah, *Practical Surface Analysis*, John Wiley & Sons 1990<br>**3.** A. Zangwill, *Physics at Surfaces*, Cambridge University Press 1988 |
| **Additional Literature** |
| **1.** A. Oleś, *Metody doświadczalne fizyki ciała stałego*, WNT 1998<br>**2.** A. Szaynok, S. Kuźmiński, *Podstawy fizyki powierzchni półprzewodników*, WNT 2000<br>**3.** N. Yao, Z.L. Wang, *Handbook of Microscopy for Nanotechnology*, Kluwer Academic Publishers 2005 |

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 11.X |
| Item Name | **General subjects to choose from:**<br>**ANALYSIS OF MULTIDIMENSIONAL ANALYTICAL DATA** |
| Course coordinator responsible for preparing the syllabus | dr inż. Jan Lamkiewicz |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| Semester | hours | Host |
|---|---|---|
| **VI** | **15** | dr inż. Jan Lamkiewicz |

1. Documentation of data and measurement results
2. Preparation of analytical data
3. Scripting languages that automate the process of analyzing analytical data
4. Chemometrics vs. Chemoinformatics
5. Methods of multivariate data analysis: principal component analysis (PCA), cluster analysis (CA) hierarchical cluster analysis (HCA), linear discriminant analysis (LDA), linear Fisher discriminant analysis (FDA), quadratic discriminant analysis (QDA), regulated discriminant analysis (RDA), k-nearest neighbor (k-NN) method, individual group modeling method (SIMCA), ANN - Artificial Neural Networks, support vector method (SVM), partial least squares method (PLS)
6. Practical use of selected methods in solving problems in the field of multidimensional analytical data analysis using the R project environment

## 3. TEACHING METHODS

Multimedia lecture with elements of data analysis based on open source programs
15 hrs

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_c | Scope and depth – completeness of cognitive perspective and dependencies<br>c) the scope of chemometric methods and computer-aided analysis of measurement results, which are used at an advanced level as tools for the analysis of multivariate data in natural sciences and engineering and technology. |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) use scientific knowledge in the field of chemometrics, computer-aided and programming to analyze multidimensional analytical data obtained from scientific experiments |
| P8S_UW_b | Knowledge use – problems solved and tasks performed<br>b) critically evaluate research data on the basis of the results of computer-aided data analysis |
| SOCIAL COMPETENCE: is ready to | |

| | |
|---|---|
| P8S_KK_c | Evaluations – a critical approach<br>c) recognising the importance of scientific knowledge in the field of multivariate data analysis in solving analytical problems |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Project | |
| P8S_WG_c | | | X | | | |
| P8S_UW_a | | | X | | | |
| P8S_UW_b | | | X | | | |
| P8S_KK_c | | | X | | | |

## 6. LITERATURE

**Basic Literature**

1. Mazerski J., Chemometria praktyczna - Interpretuj wyniki swoich pomiarów,2009, Wydawnictwo Malamut, ISBN: 978-83-925269-3-3
2. Zuba D., Parczewski A. (red.), 2008 Chemometria w analityce. Wybrane zagadnienia, ISBN 83-87425-13-3
3. Kurt Varmuza, Peter Filzmoser Introduction to Multivariate Statistical Analysis in Chemometrics, Taylor & Francis Inc; 2009
3. Autorskie materiały robocze do wykładów udostępniane na pierwszych zajęciach oraz dostępne online

**Additional Literature**

1. Adams M.J., 2004, Chemometrics in Analytical Spectroscopy, 2nd Edition
2. Geladi, P.; Esbensen, K., 2005, "The Start and Early History of Chemometrics: Selected Interviews. Part 1". J. Chemometrics 4 (5): 337–354, doi:10.1002/cem.1180040503.
3. Esbensen, K.; Geladi, P., 2005, "The Start and Early History of Chemometrics: Selected Interviews. Part 2". J. Chemometrics 4 (6): 389–412, doi:10.1002/cem.1180040604

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.ich.I |
| Item Name | **A block of subjects from the discipline *of chemical engineering* to choose from:**<br>**MEMBRANE BIOREACTORS** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Wirginia Tomczak, prof. PBŚ |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| Semester | hours | Host |
|---|---|---|
| **VI** | **15*** | dr hab. inż. Wirginia Tomczak, prof. PBŚ |

*- subject taught separately in a group of disciplines

Lecture 1. Membranes - structure, classification, characteristics and methods of obtaining
Lecture 2. Advantages of membrane processes
Lecture 3. Pressure membrane processes - Principles of operation and examples of applications
Lecture 4. Principle of operation and advantages of membrane bioreactors
Lecture 5. Membrane Blocking in Membrane Bioreactors
Lecture 6. Application examples of membrane bioreactors
Lecture 7. Influence of Process Parameters on the Performance of Membrane Bioreactors

## 3. TEACHING METHODS

multimedia lecture, discussion
(15 hours)

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies:<br>a) to the extent that allows for the revision of existing paradigms, the world achievements, including theoretical foundations and general issues and selected specific issues – specific to a given scientific or artistic discipline |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies:<br>b) the main development trends of the scientific or artistic disciplines in which education takes place, |
| SKILLS: can | |
| P8S_UK_a | Communication – receiving and creating statements, disseminating knowledge in the scientific community and using a foreign language:<br>a) communicate on specialist topics to the extent that allows active participation in the international scientific community |
| P8S_UW_b | Use of knowledge – problems solved and tasks performed:<br>b) critically analyse and evaluate the results of scientific research, expert activity and other creative work and their contribution to the development of knowledge |

| SOCIAL COMPETENCE: is ready to | |
|---|---|
| P8S_KK_c | Assessments – a critical approach:<br>c) recognising the importance of knowledge in solving cognitive and practical problems |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Project | … |
| P8S_WG_a | | | X | | | |
| P8S_WG_b | | | X | | | |
| P8S_UK_a | | | X | | | |
| P8S_UW_b | | | X | | | |
| P8S_KK_c | | | | X | | |

## 6. LITERATURE

**Basic Literature**

1. Ratajczak P., 2013. Procesy membranowe – wprowadzenie. Tech. Wod. 4, 16–20.
2. Tomczak W., Gryta M., 2022. Energy-efficient AnMBRs technology for treatment of wastewaters: A review. Energies, 15(14), 4981. DOI: 10.3390/en15144981
3. Praca zbiorowa pod red. A. Narębskiej, Membrany i membranowe techniki rozdziału, UMK, Toruń, 1997.

**Additional Literature**

1. Tomczak W., Gryta M., Grubecki I., Miłek J., 2023. Biogas production in AnMBRs via treatment of municipal and domestic wastewater: Opportunities and fouling mitigation strategies. Applied Sciences 13(11), 6466. DOI: 10.3390/app13116466

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.ich.II |
| Item Name | **A block of subjects from the discipline *of chemical engineering* to choose from:**<br>**BIOCHEMICAL ENGINEERING IN SUSTAINABLE DEVELOPMENT TECHNOLOGIES** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Justyna Miłek |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| Semester | hours | Host |
|---|---|---|
| **VI** | **15*** | dr hab. inż. Justyna Miłek |

*- subject taught separately in a group of disciplines

Influence of hydrodynamic conditions on living cells. Methods of conducting biotechnological processes – bioreactors, photobioreactors. Basic techniques for the separation of bio-based products. Industrial production of biodiesel. Production of biopharmaceuticals. Production of biofuels from biomass.

## 3. TEACHING METHODS

multimedia lecture, demonstration, discussion, case method
(15 hours)

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | to the extent that allows for the revision of existing paradigms – a global achievement, including theoretical foundations as well as general issues and selected specific issues – specific to chemical engineering |
| P8S_WG_b | Main development trends in the discipline of chemical engineering |
| SKILLS: can | |
| P8S_UW_b | critically analyse and evaluate the results of scientific research, expert activity and other creative work and their contribution to the development of knowledge |
| P8S_UK_a | communicate on specialist topics to the extent that allows active participation in the international scientific community |
| P8S_UU_a | independently plan and act for their own development and inspire and organize the development of others |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_c | recognition of the importance of knowledge in solving cognitive and practical problems |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Project | … |
| P8S_WG_a | | | | X | | |
| P8S_WG_b | | | X | | | |
| P8S_UW_b | | | | X | | |
| P8S_UK_a | | | X | X | | |
| P8S_UU_a | | | X | | | |
| P8S_KK_c | | | X | X | | |

## 6. LITERATURE

| **Basic Literature** |
|---|
| 1. C. Larroche, M. Á. Sanromán, G. Du, A. Pandey (red.) Current developments in biotechnology and bioengineering bioprocesses, bioreactors and controls, Elsevier Science Academic Press, 2017 (e-book).<br>2. M. Jerold and V. Sivasubramanian (red.) Biochemical and environmental bioprocessing challenges and developments, CRC Press, 2020 (e-book). |
| **Additional Literature** |
| 1. R. Pogaku, A. Bono, C. Chu (red.) Developments in sustainable chemical and bioprocess technology, Springer Science+Business Media, New York, 2013 (e-book). |

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.ich.III |
| Item Name | **A block of subjects from the discipline *of chemical engineering* to choose from: SELECTED ASPECTS OF THE PRACTICAL APPLICATION OF CHEMICAL ENGINEERING** |
| Course coordinator responsible for preparing the syllabus | dr inż. Sławomir Żak |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| Semester | hours | Host |
|---|---|---|
| **VI** | **15*** | dr inż. Sławomir Żak |

*- subject taught separately in a group of disciplines

Elements of design and practical conduct of selected operations and unit processes in the chemical industry. Phase transitions in energy balances – examples of industrial applications and calculation rules. Heat Pipe Heat Exchangers – Basics of Calculation and Design as well as Areas of Application in the Chemical Industry. Selected aspects of material balances and economics of chemical processes for full-scale industrial conditions. Liquid flow and material conditions of transport pipelines and fittings – on selected industrial examples with calculations. Filtration on an industrial scale and the basis of pressure calculations of chamber presses.

## 3. TEACHING METHODS

multimedia lecture, demonstration, discussion, lecture, case method
(15 hours)

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WK_c | c) basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to these results |
| SKILLS: can | |
| P8S_UW_a | a) use knowledge from various fields of science to creatively identify, formulate and innovatively solve complex problems or perform research tasks, and in particular: define the purpose and object of scientific research, formulate a research hypothesis, develop research methods, techniques and tools and creatively apply them, draw conclusions based on the results of scientific research |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | a) critical evaluation of achievements within the scientific discipline of chemical engineering, |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Project | … |
| P8S_WK_c | | | | x | | |
| P8S_UW_a | | | | x | | |
| P8S_KK_a | | | | x | | |

## 6. LITERATURE

| **Basic Literature** |
|---|
| 1. Praca zbiorowa pod redakcją Synoradzki L., Wisialski J., 2019, Projektowanie procesów technologicznych. Od laboratorium do instalacji przemysłowej. Oficyna Wydawnicza Politechniki Warszawskiej, 258.<br>2. Praca zbiorowa pod redakcją Synoradzkiego L., Wisialskigo J., 2012, Projektowanie procesów technologicznych. Bezpieczeństwo procesów chemicznych. Oficyna Wydawnicza Politechniki Warszawskiej, 214.<br>3. Gadomska-Gajadhur A., Jańczewski D., Różycki C., Synoradzki L., 2020, Projektowanie procesów technologicznych. Matematyczne metody planowania eksperymentów. Oficyna Wydawnicza Politechniki Warszawskiej, 244. |
| **Additional Literature** |
| 1. Kucharski S., Głowiński J., 2010, Podstawy obliczeń projektowych w technologii chemicznej, Oficyna Wydawnicza Politechniki Wrocławskiej, 318.<br>2. Dylewski R., 1999, Projekt technologiczny: rodzaje opracowań badawczych i badawczo-projektowych, przykłady, materiały pomocnicze, Wydawnictwo Politechniki Śląskiej, 112.<br>3. Jańczewski D., Różycki C., Synoradzki L., 2010, Projektowanie procesów technologicznych. Część II. Matematyczne metody planowania eksperymentów, Oficyna Wydawnicza Politechniki Warszawskiej, 244. |

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.ich.IV |
| Item Name | **A block of subjects from the discipline *of chemical engineering* to choose from:**<br>**MODERN METHODS OF TESTING POLYMER MATERIALS** |
| Course coordinator responsible for preparing the syllabus | dr inż. Krzysztof Lewandowski<br>dr inż. Katarzyna Skórczewska, prof. PBŚ |

## 3. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15*** | dr inż. Krzysztof Lewandowski<br>dr inż. Katarzyna Skórczewska, prof. PBŚ |

*- subject taught separately in a group of disciplines

Influence of chemical structure on selected functional and processing properties of polymer plastics. The concept of polymer plastics. Identification test methods – quantitative and qualitative analysis of polymers. Modern methods of structural analysis of plastics. Principles for the determination of mechanical, thermal and processing properties of polymer plastics. Standardization of tests. Advanced and modern measurement techniques. Design and implementation of a research program in terms of solving practical and scientific problems related to polymer plastics.

## 4. TEACHING METHODS

| |
|---|
| Multimedia lecture, discussion<br>(15 hours) |

## 5. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies<br>a) to the extent that allows for the revision of existing paradigms – global achievements, including theoretical foundations and general issues and selected specific issues in the field of chemical engineering related to polymer materials |
| P8S_WG_c | Context – conditions, effects<br>c) research methodology with particular emphasis on polymer materials |
| P8S_WK_c | Context – conditions, effects<br>c) basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to these results |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) use knowledge from various fields of science and chemical engineering to creatively identify, formulate and innovatively solve complex problems or perform research tasks, and in particular: define the purpose and object of scientific |

| | |
|---|---|
| | research, formulate a research hypothesis, develop research methods, techniques and tools and creatively apply them, draw conclusions based on the results of scientific research |
| P8S_UW_b | Knowledge use – problems solved and tasks performed<br>b) critically analyse and evaluate the results of scientific research, expert activity and other creative work and their contribution to the development of knowledge in the field of chemical engineering |
| P8S_UO_a | Work organization – planning and teamwork<br>a) plan and implement individual and team research projects |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_c | Evaluations – a critical approach<br>c) recognizing the importance of knowledge in solving cognitive and practical problems in the field of chemical engineering, |
| P8S_KR | Professional role – independence and ethos development<br>maintaining and developing the ethos of research and creative communities, including: conducting scientific activity in an independent manner, respecting the principle of public ownership of the results of scientific activity, taking into account the principles of intellectual property protection |

## 6. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | x | | x | |
| P8S_WG_c | | | x | | x | |
| P8S_WK_c | | | x | | x | |
| P8S_UW_a | | | x | | x | |
| P8S_UW_b | | | x | | x | |
| P8S_UO_a | | | x | | x | |
| P8S_KK_c | | | x | | x | |
| P8S_KR | | | x | | x | |

## 7. LITERATURE

**Basic Literature**

1. Broniewski T., Kapko J., Płaczek W., Thomalla J.: Metody badań i ocena właściwości tworzyw sztucznych, WNT, Warszawa 2000
2. Grellmann W. (red), Seidler S. (red.): Polymer Testing, Hanser Publications; Monachium 2007
3. Brown R. (red.): Handbook of Polymer Testing - Short-Term Mechanical Tests, Rapra Technology Limited, Shawbury 2002
4. Normy europejskie i polskie: EN ISO 527, EN ISO 1133, EN ISO 179, EN ISO 306

**Additional Literature**

1. Karasiewicz T., Moraczewski K., Rytlewski P., Stepczyńska M., Żenkiewicz M.: Metody badań i oceny niektórych właściwości tworzyw polimerowych i metali, Wydawnictwo UKW, Bydgoszcz 2012
2. Przygocki W.: Metody fizyczne badań polimerów, PWN, Warszawa 1990
3. scopus.com

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.ich.V |
| Item Name | **A block of subjects from the discipline *of chemical engineering* to choose from:**<br>**MODERN TECHNIQUES OF PLASTICS PROCESSING** |
| Course coordinator responsible for preparing the syllabus | dr inż. Krzysztof Lewandowski<br>dr inż. Katarzyna Skórczewska, prof. PBŚ |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| Semester | hours | Host |
|---|---|---|
| **VI** | **15*** | dr inż. Krzysztof Lewandowski |

*- subject taught separately in a group of disciplines

Properties of polymers in the plasticized state. Characteristics of processing methods for thermoplastics – extrusion, injection, rolling, rotational casting and others. Current directions of development of injection and extrusion process technology. Selected issues in the production of complex polymer materials using various processing techniques. Modern design solutions for machines and tools designed for the processing of polymer plastics. Issues in the field of modern techniques and lines for recycling polymer plastics.

## 3. TEACHING METHODS

Multimedia lecture, discussion
(15 hours)

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies<br>a) to the extent enabling the revision of existing paradigms – global achievements, including theoretical foundations and contemporary general issues and selected specific issues specific to chemical engineering, in particular in the field of modern techniques of polymer plastics processing, their importance and prospects for development, |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies<br>b) main development trends in the discipline of chemical engineering, in particular prospects for the development of polymer plastics processing techniques, |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) use knowledge from various fields of science to creatively identify, formulate and innovatively solve complex problems or perform research tasks in the field of chemical engineering, especially the design of modern techniques for processing polymer plastics |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Evaluations – a critical approach |

| | |
|---|---|
| | a) critical evaluation of achievements in chemical engineering |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Project | Discussion |
| P8S_WG_a | | | X | | | X |
| P8S_WG_b | | | X | | | X |
| P8S_UW_a | | | X | | | X |
| P8S_KK_a | | | X | | | X |

## 6. LITERATURE

| **Basic Literature** |
|---|
| 1.Wilczyński K. (red.), 2019, Przetwórstwo tworzyw polimerowych, Oficyna Wydawnicza Politechniki Warszawskiej.<br>2. Sikora R., 1993, Przetwórstwo tworzyw wielkocząsteczkowych, Żak Wydawnictwo Edukacyjne Zofii Dobkowskiej.<br>3. Pearson J. R. A., 1985, Mechanics of polymer processing, Elsevier Applied Science Publishers |
| **Additional Literature** |
| 1. Sikora R. (red), 2006, Przetwórstwo tworzyw polimerowych : podstawy logiczne, formalne i terminologiczne, Wydawnictwo Uczelniane Politechniki Lubelskiej.<br>2. Bociąga E.. 2008, Specjalne metody wtryskiwania tworzyw sztucznych, WNT |

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Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.ich.VI |
| Item Name | **A block of subjects from the discipline *of chemical engineering* to choose from:**<br>**MODERN ANTI-CORROSION TECHNOLOGIES** |
| Course coordinator responsible for preparing the syllabus | dr inż. Joanna Kowalik<br>dr inż. Anna Zalewska |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| Semester | hours | Host |
|---|---|---|
| **VI** | **15*** | dr inż. Joanna Kowalik<br>dr inż. Anna Zalewska |

*- subject taught separately in a group of disciplines

Applicable standards in the field of PN-EN ISO 12944. Corrosion protection of steel structures with protective paint systems. Interpretation of requirements and principles of selection of anti-corrosion paint protection – examples of painting systems. Types of anti-corrosion products and their application. New trends and technologies in the execution of corrosion protection. Quality control of paint coatings - accelerated and physico-mechanical tests.

## 3. TEACHING METHODS

lecture with multimedia presentation, discussion
(15 hours)

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies<br>(a) to the extent that it is possible to revise existing paradigms,<br>global achievements, including theoretical foundations and issues<br>general and selected specific issues specific to chemical engineering |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies<br>b) main development trends in the discipline of chemical engineering |
| P8S_WG_c | Context – conditions, effects<br>c) methodology of scientific research in chemical engineering |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) use knowledge from various fields of science to creatively identify, formulate and innovatively solve complex problems or perform research tasks in the field of chemical engineering |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Evaluations – a critical approach<br>a) critical evaluation of achievements in chemical engineering |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Project | Discussion |
| P8S_WG_a | | | X | | | X |
| P8S_WG_b | | | X | | | X |
| P8S_WG_c | | | X | | | X |
| P8S_UW_a | | | X | | | X |
| P8S_KK_a | | | X | | | X |

## 6. LITERATURE

**Basic Literature**

1. Zenowicz Z., Gauda K., Powłoki organiczne w technice antykorozyjnej, Politechnika Lubelska, 2003.
2. Moller P. Nielsen L.P., Advanced Surface Technology, 2013 National Assocition for Surface Finishing, Moller and Nielsen, Volume 01, 02
3. Wójtowicz M., Piwowarczyk W., Zasady diagnostyki zabezpieczeń antykorozyjnych stalowych konstrukcji budowlanych, Instytut Techniki Budowlanej, 2008.
4. Wójtowicz M., Zabezpieczenia przed korozją stalowych konstrukcji budowlanych za pomocą powłok malarskich, Instytut Techniki Budowlanej, 2010.

**Additional Literature**

1. Normy: Farby i lakiery
2. Czasopismo Lakiernictwo, www.lakiernictwo.net
3. Publikacje z naukowych baz danych: Science Direct, Scopus, Web of Science

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.ich.VII |
| Item Name | **A block of subjects from the discipline *of chemical engineering* to choose from:**<br>**NEW POLLUTANTS AND THEIR ENVIRONMENTAL EFFECTS** |
| Course coordinator responsible for preparing the syllabus | dr inż. Alicja Gackowska<br>dr inż. Waldemar Studziński |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| Semester | hours | Host |
|---|---|---|
| **VI** | **15*** | dr inż. Alicja Gackowska<br>dr inż. Waldemar Studziński |

*- subject taught separately in a group of disciplines

1. Classification, potential sources and risks of emerging pollutants.
2. Emerging pollutants in the aquatic environment: occurrence, monitoring, fate and risk assessment.
3. Pharmaceutical residues in the environment – methods of identification, advanced disposal methods, ecotoxicological assessment of pharmaceutical residues and their transformation products.
4. Monitoring of microplastics in environmental matrices. Innovative methods for the degradation of microplastics in the aquatic environment.
5. Microplastics as Emerging Food Contaminants: A Food Safety Challenge.
6. Evaluation of environmental properties and toxicity of UV filters.
7. Residues of plant protection products. Monitoring of food products. Rules for the safe use of pesticides.

## 3. TEACHING METHODS

multimedia lecture, discussion
(15 hours)

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies<br>a) to the extent that allows for the revision of existing paradigms, the world achievements, including theoretical foundations and general issues and selected specific issues – specific to a given scientific or artistic discipline |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies<br>b) the main development trends of the scientific or artistic disciplines in which education takes place, i.e. related to the identification of new environmental pollutants and the assessment of the impact of pollution on individual elements of the environment |
| P8S_WG_c | Scope and depth – completeness of cognitive perspective and dependencies<br>(c) the methodology of scientific research in the field of environmental sampling and analysis and the evaluation of ecotoxicology |

| | |
|---|---|
| P8S_WK_c | Context – conditions, effects<br>c) basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to these results |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) use knowledge from various fields of science or art to creatively identify, formulate and innovatively solve complex problems or perform research tasks, and in particular: define the purpose and object of scientific research, formulate a research hypothesis, develop research methods, techniques and tools and creatively apply them, draw conclusions based on the results of scientific research |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Evaluations – a critical approach<br>a) critical evaluation of achievements within a given scientific or artistic discipline |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Project | Discussion |
| P8S_WG_a | | | x | | | |
| P8S_WG_b | | | | x | | |
| P8S_WG_c | | | | x | | |
| P8S_WK_c | | | | | | x |
| P8S_UW_a | | | | x | | |
| P8S_KK_a | | | | | | x |

## 6. LITERATURE

**Basic Literature**

1. Dudziak, M., 2018, Substancje aktywne biologicznie w środowisku człowieka : wybrane problemy, Gliwice : Wydawnictwo Politechniki Śląskiej, 2018.
2. Kapelewska, J., 2020, Związki endokrynnie czynne w środowisku wodnym - analityka i wpływ na organizmy żywe, Warszawa : Wydawnictwo Naukowe PWN, 2020, Strony 661-674
3. Wszołek, T., 2018, Ochrona środowiska dla inżynierów, Warszawa : Wydawnictwo Naukowe

**Additional Literature**

1. Meller, E., 2021, Aktualne problemy naukowo-badawcze w inżynierii środowiska : praca zbiorowa, Szczecin : Wydawnictwo Uczelniane Zachodniopomorskiego Uniwersytetu Technologicznego, 2021.
2. Wąsowski, J., 2020, Mikroplastiki w środowisku wodnym, Warszawa : Wydawnictwo Naukowe PWN SA

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.ich.VIII |
| Item Name | **A block of subjects from the discipline *of chemical engineering* to choose from:**<br>**MODERN METHODS OF METAL REMOVAL IN INDUSTRY AND THE ENVIRONMENT** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Katarzyna Witt |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| Semester | hours | Host |
|---|---|---|
| **VI** | **15*** | dr hab. inż. Katarzyna Witt |

*- subject taught separately in a group of disciplines

Specificity of metals. Non-anthropogenic and anthropogenic sources of metals. Metal removal methods used in the natural and industrial environment. Permeable reactive barriers. Metal sorption on various natural and synthetic materials (microorganisms, plants, shells, zero-valent iron, activated carbons, peat, zeolites, fly ashes, etc.). Precipitation methods. Membrane methods (nano-, ultra-, microfiltration, reverse osmosis, absorption membranes, polymer inclusion membranes).

## 3. TEACHING METHODS

multimedia lecture, discussion
(15 hours)

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | to the extent that it allows you to learn about the world's achievements, including theoretical foundations and general issues and selected specific issues related to the issues of metal removal |
| P8S_WG_b | Main development trends in scientific disciplines related to metal removal |
| P8S_WG_c | methodology of scientific research in the field of metal removal methods |
| P8S_WK_c | basic principles of knowledge transfer to the economic and social sphere and commercialization of scientific research results and know-how related to these results |
| SKILLS: can | |
| P8S_UW_a | use knowledge from various fields of science to creatively identify, formulate and innovatively solve complex problems or perform research tasks, and in particular: define the purpose and object of scientific research, formulate a research hypothesis, develop research methods, techniques and tools and creatively apply them, draw conclusions based on the results of scientific research |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | critical evaluation of achievements within the discipline of chemical engineering |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Project | … |
| P8S_WG_a | | | X | | | |
| P8S_WG_b | | | X | | | |
| P8S_WG_c | | | X | | | |
| P8S_WK_c | | | X | | | |
| P8S_UW_a | | | X | | | |
| P8S_KK_a | | | X | | | |

## 6. LITERATURE

| **Basic Literature** |
|---|
| 1. Karwowska E. 2007. Mikrobiologiczne procesy usuwania metali ze ścieków i szlamów galwanizerskich. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa.<br>2. Gąsiorek J. 2010. Dwustopniowe biologiczne usuwanie metali ciężkich z osadów ściekowych na przykładzie nadmiernego osadu czynnego. Wydawnictwo Politechniki Poznańskiej, Poznań.<br>3. Kuczajowska-Zadrożna M. 2016. Usuwanie metali ciężkich przez biosorbenty. Wydawnictwo Uniwersytetu Warminsko-Mazurskiego, Olsztyn. |
| **Additional Literature** |
| 1. Sastre A.M., Pabby A.K., Rizvi S.S.H. 2008. Handbook of Membrane Separations. CRC Press |

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.ilgit.I |
| Item Name | **A block of subjects from the discipline of *civil engineering, geodesy and transport* to choose from: PROTECTING BUILDING PARTITIONS FROM ENVIRONMENTAL IMPACTS** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Maria Wesołowska, profesor PBŚ |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15** | dr hab. inż. Maria Wesołowska, profesor PBŚ |

Physical phenomena affecting the durability of building materials – examples of experimental research and modeling.
Chemical processes affecting the durability of building materials. Internal and external factors that trigger chemical corrosion. Impact of soluble mineral salts on selected materials and material systems, the phenomenon of efflorescence and subflorescence – examples of experimental research.
The role of mortar in shaping the integrity and thermal properties of masonry – examples of experimental research and modelling.
Susceptibility of material systems of building partitions and their details to internal and external environmental factors. Identification of biotic and abiotic factors.
The phenomenon of driving rain and the state of thermal and moisture protection of walls.
Protection of historic buildings: repair works and improvement of the state of thermal protection.
Selected methods and research devices monitoring the condition of building partitions and built-in materials.

## 3. TEACHING METHODS

Lecture - 7 hours, seminar - 8 hours

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies<br>The doctoral student has in-depth knowledge related to the global scientific achievements including theoretical foundations as well as general issues and selected specific issues in the field of building physics and physics of building materials. |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies |

| | |
|---|---|
| | b) main development trends in the discipline of civil engineering, geodesy and transport |
| P8S_WG_c | Context – conditions, effects<br>The PhD student is familiar with the latest achievements in the field of modelling and experimental research of thermal and humidity phenomena in building partitions |
| P8S_WK_c | Context – conditions, effects<br>A doctoral student knows the basic principles of knowledge transfer to the economic sphere in the discipline of civil engineering, geodesy and transport. |
| SKILLS: can | |
| P8S_UW_a | A PhD student is able to propose methods, techniques and research tools to solve a research problem related to the issues of building physics in relation to the existing state of knowledge. |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | A PhD student is ready to conduct research in an independent manner while maintaining ethical and legal standards in research work. Understands the responsibility for the proposed solutions and formulated opinions on thermal and humidity issues in building partitions. |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | | x | | |
| P8S_WG_b | | | | x | | |
| P8S_WG_c | | | | x | | |
| P8S_WK_c | | | | x | | |
| P8S_UW_a | | | | x | x | |
| P8S_KK_a | | | | | x | |

## 6. LITERATURE

**Basic Literature**

1. Wesołowska M.: Ochrona murów licowych przed wpływem środowiska, Uniwersytet Technologiczno-Przyrodniczy w Bydgoszczy, Bydgoszcz 2016.
2. Wesołowska M., Szczepaniak P., Pawłowski K., Kaczmarek A.Zagadnienia fizykalne w termomodernizacji i remontach obiektów budowlanych, Wydawnictwa Uczelniane Uniwersytetu Technologiczno-Przyrodniczego 2020.

**Additional Literature**

1. Garbalińska H., Gawin D., Nowak H.: Fizyka budowli w Polsce: ośrodki naukowe, ich potencjał i osiągnięcia. Wydawnictwo Politechniki Łódzkiej 2021.
2. Wójcik R.: Docieplanie budynków od wewnątrz. Grupa Medium 2018.

3. Tokarski D. Ickiewicz I. : Naprawy zabytkowych murów warstwami uzupełniającymi z dodatkiem biowęgla, oficyna wydawnicza Politechniki Białostockiej 2021.

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.ilgit.II |
| Item Name | **A block of subjects from the discipline of *civil engineering, geodesy and transport* to choose from: MANAGING CONSTRUCTION PROJECTS FROM A SUSTAINABLE PERSPECTIVE** |
| Course coordinator responsible for preparing the syllabus | dr inż. Jarosław Górecki |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15** | dr inż. Jarosław Górecki |

Prospects for managing an investment and construction project: scope, time, cost and quality. Stakeholders of investment and construction projects. Work Breakdown Structure (WBS). Optimization of technological and organizational solutions. Risk analysis of construction projects. Risk factors in individual phases of a construction project. Reliability of construction production lines. Optimization of construction schedules. Intelligent investment and construction project management systems. Operational management in the management of investment and construction projects. Simulations of the course of construction projects. The roles of the individual stakeholders in the project. BIM in the service of building information management. Global economy and sustainable development. Reducing the negative impact on the environment, including reducing CO2 emissions. Circular Economy. Legal basis for sustainable development in construction. Assessment of the impact of a building on the environment. LEED. BREEAM. The concept of embodied energy in the cycle of a building object. Analysis of economic indicators and sustainable development in construction. Environmentally friendly technologies and materials used, as well as design in construction according to the principles of sustainable development and circular economy. Examples of integrated architectural and construction design taking into account economic, ecological and social aspects. Lean management in construction.

## 3. TEACHING METHODS

lecture
lecture – 15 hours

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies |

| | |
|---|---|
| | a) to the extent enabling the revision of the existing paradigms – global achievements, including theoretical foundations and general issues and selected specific issues for the discipline of civil engineering, geodesy and transport, and in particular technical, economic and environmental conditions for the implementation of construction works, |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies<br>b) main development trends for the discipline of civil engineering, geodesy and transport, in particular in the field of technical, economic and environmental conditions for the implementation of buildings |
| P8S_WG_c | Scope and depth – completeness of cognitive perspective and dependencies<br>c) methodology of scientific research for the discipline of civil engineering, geodesy and transport, taking into account technical, economic and environmental aspects of the implementation of construction facilities |
| P8S_WK_c | Context – conditions, effects<br>c) basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to these results for the discipline of civil engineering, geodesy and transport, and in particular in the field of technical, economic and environmental conditions for the implementation of construction facilities |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>b) use knowledge from the discipline of civil engineering, geodesy and transport and other related disciplines (including: materials engineering and environmental engineering, mining and energy), as well as other fields (Journal of Social Sciences) to creatively identify, formulate and innovatively solve complex problems or perform research tasks in relation to the technical, economic and environmental conditions for the implementation of construction facilities |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Evaluations – a critical approach<br>a) critical evaluation of achievements within the discipline of civil engineering, geodesy and transport, and in particular collaboration with other researchers in the field of technical, economic and environmental conditions for the implementation of buildings |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | x | | | |
| P8S_WG_b | | | x | | | |
| P8S_WG_c | | | x | | | |
| P8S_WK_c | | | x | | | |
| P8S_UW_a | | | | | x | |
| P8S_KK_a | | | | | x | |

## 6. LITERATURE

| Basic Literature |
|---|
| 1. Bizon-Górecka J., Determinanty sukcesu przedsiębiorstw budowlanych zaangażowanych w realizację projektów w międzynarodowej kooperacji, TNOiK, Bydgoszcz 2011.<br>2. Bizon-Górecka J., Modelowanie struktury systemu zarządzania ryzykiem w przedsiębiorstwie – ujęcie holistyczne, TNOiK, Bydgoszcz 2007.<br>3. Hegazy T., Computer-Based Construction Project Management (ebook), Pearson 2013.<br>4. Jaworski K. M., Metodologia projektowania realizacji budowy, PWN, Warszawa 1999.<br>5. Kibert Ch. J., Sustainable Construction: Green Building Design and Delivery. John Wiley & Sons 2012.<br>6. Pawlak M., Zarządzanie projektami, Wydawnictwo Naukowe PWN, Warszawa 2007.<br>7. Risk Management Treatise for Engineering Practitioners, Ed. Chike Oduoza, IntechOpen, London, 2018.<br>8. Rubrich L., An Introduction to Lean Construction: Applying Lean to Construction Organizations and Processes. WCM Associates LLC 2012. |
| **Additional Literature** |
| 1. Bizon-Górecka J., Inżynieria niezawodności i ryzyka w zarządzaniu przedsiębiorstwem. OPO, Bydgoszcz 2001.<br>2. Dholakia R., Wackernagel M., Ecological Footprint Accounts: Moving Sustainability [w:] Concept to Measurable Goal. Oakland: Redefining Progress 1999.<br>3. Mamlouk M. S., Zaniewski J. P., Materials for Civil and Construction Engineers (ebook), Pearson 2017.<br>4. Wideman R. M. First Principles of Project Management. AEW Services, Vancouver, BC Corporation 2000.<br>5. Międzynarodowe bazy książek i czasopism (np. Scopus, Web of Science).<br>6. PN-EN ISO 14001:2015-09 - wersja polska. Systemy zarządzania środowiskowego – Wymagania i wytyczne stosowania.<br>7. PN-EN ISO 14040:2009 - wersja polska. Zarządzanie środowiskowe – Ocena cyklu życia – Zasady i struktura. |

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.ilgit.III |
| Item Name | **A block of subjects from the discipline of *civil engineering, geodesy and transport* to choose from: DURABILITY OF BUILDING STRUCTURES** |
| Course coordinator responsible for preparing the syllabus | dr inż. Justyna Sobczak-Piąstka |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15** | dr inż. Justyna Sobczak-Piąstka |

**Lecture**:
Shaping the basic structural elements of buildings, assessment of their function. Limit states of the structure, and the durability and reliability of this structure. Identification of environmental factors causing a decrease in the durability of the building structure. Designing building structures in terms of durability, taking into account the resistance of the structure to environmental factors causing degradation throughout the life of the building (primarily during the period of use of the structure). General requirements for the execution, acceptance and inspection of construction works. Rules for performing periodic inspections of buildings. Object Book. Rules for maintaining buildings.
Basic issues in the field of diagnostics of the technical condition of buildings and the causes of damage to these structures. Basic methods (destructive and non-destructive) of assessing the technical condition and the principles of determining the wear and tear of buildings. Damage classification.
Methods of repairing, strengthening and renovating elements of reinforced concrete, steel and wooden structures. Materials and technologies used Method of preparing the test report and repair documentation.
**Exercises**:
An element of the building should be designed during the durability period under the given environmental impacts. The principles and requirements of the Eurocodes shall be fully applied in the design.

## 3. TEACHING METHODS

lecture (8 hours) lecture classes (7 hours)

a lecture carried out with the use of multimedia techniques or a lecture using the classic method "blackboard and chalk"; auditorium exercises solving a given problem.

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies<br>a) to the extent enabling the revision of existing paradigms – global achievements, including theoretical foundations and general issues and selected specific issues concerning the use of the method of limit states in the issues of durability of building structures |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies<br>b) main development trends in the field of diagnostics of building structures and modern technologies of strengthening and renovation of building structures, |
| P8S_WG_c | Scope and depth – completeness of cognitive perspective and dependencies<br>c) methodology of scientific research in the field of durability of structures within the discipline of civil engineering, geodesy and transport |
| P8S_WK_c | Context – conditions, effects<br>c) basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to these results for the discipline of civil engineering, geodesy and transport |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) use the knowledge in the field of designing and diagnosing the technical condition and durability of buildings to creatively identify, formulate and innovatively solve complex problems in this area;<br>perform research tasks, in particular: define the purpose and subject of scientific research, develop research methods, techniques and tools and creatively apply them, draw conclusions based on the results of scientific research |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Evaluations – a critical approach<br>a) critical assessment of the achievements related to the design and diagnosis of durability of building structures within the discipline of civil engineering, geodesy and transport |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | X | | X | | |
| P8S_WG_b | | X | | X | | |
| P8S_WG_c | | X | | X | | |
| P8S_WK_c | | X | | X | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| P8S_UW_a | | X | | X | | |
| P8S_KK_a | | | | X | | |

## 6. LITERATURE

| Basic Literature |
|---|
| 1. Ściślewski J., Trwałość konstrukcji żelbetowych. Prace Naukowe ITB, Seria Monografie, Warszawa 1996<br>2. Drobiec Ł., Jasiński R., Piekarczyk A., Diagnostyka konstrukcji żelbetowych, Tom 1. Metodologia, badania polowe, badania laboratoryjne betonu i stali, Wydawnictwo Naukowe PWN, 2010<br>3. Zybura A., Jaśniok M., Jaśniok T., Diagnostyka konstrukcji żelbetowych, Tom 2. Badania korozji zbrojenia i właściwości ochronnych betonu, Wydawnictwo Naukowe PWN, 2014<br>4. Błaszczyński T., Trwałość budynków i budowli. Dolnośląskie Wydawnictwo Edukacyjne, 2012<br>5. Czarnecki L., Emmons P. H., Naprawa i ochrona konstrukcji betonowych. Polski Cement, Kraków 2002<br>6. Runkiewicz L., Wzmacnianie konstrukcji żelbetowych. ITB, Warszawa 2011<br>7. Nowak A. S., Collins K. R., Reliability of structures, McGraw-Hill, Boston 2000<br>8. Eleni N. Ch., Identification methods for structural health monitoring, Springer, 2016<br>9. Balu A. S., Rao B. N., Structural reliability bounds, LAMBERT Academic Publishing, 2012<br>10. Yan-Gang Z., Structural reliability: approaches from perspectives of statistical moments, John Wiley and Sons Ltd, 2021<br>11. Applicable standards |
| **Additional Literature** |
| 1. Ściślewski Z., Ochrona konstrukcji żelbetowych. Arkady, Warszawa 1999<br>2. Król M., Tur W., Kondratczyk A., Beton ekspansywny do stosowanie w budownictwie. Katalog napraw i wzmocnień. Wydawnictwo Politechniki Lubelskiej, Lublin 1996<br>3. Masłowski E., Spiżewska D., Wzmocnienia konstrukcji budowlanych. Arkady, Warszawa 2000<br>4. Arendorski J., Trwałość i niezawodność budynków mieszkalnych, Arkady, Warszawa 1978<br>5. Biegus A. Probabilistyczna analiza konstrukcji stalowych, PWN, 1999 Warszawa<br>6. Machowski A., Zagadnienia stanów granicznych i niezawodności szkieletów stalowych budynków wielokondygnacyjnych, Wydawnictwo Politechniki Krakowskiej, Monografia 262, seria Inżynieria lądowa", Kraków 1999 |

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.ilgit.IV |
| Item Name | **A block of subjects from the discipline of *civil engineering, geodesy and transport* to choose from: NEW GENERATION CONCRETES AND CONCRETE STRUCTURES** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Maciej Dutkiewicz, prof. PBŚ |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15** | dr hab. inż. Maciej Dutkiewicz, prof. PBŚ |

1. The role of material modification in modern concrete technology – shaping the microstructure of concrete by using mineral additives and chemical admixtures.
2. Self-compacting concretes – introduction. Origin, essence and significance in construction. Self-Compacting Mixture Properties and Test Methods.
3. High-strength concretes – introduction. Development, classification, components of high-strength concrete and their importance. The use of high-strength concrete in construction
4. Safety of concrete structures in the limit state method. Material features adopted in design.
5. Idealization of construction. Steel and concrete models. Methods of structural analysis.
6. Concrete destruction and plasticizing strength. Analysis of cross-sections in elements with reinforcement.

## 3. TEACHING METHODS

Lecture – 15 hours
Classes will be conducted in the form of multimedia lectures. Distance learning is possible synchronously.

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies to the extent that allows for the revision of existing paradigms – global achievements, including theoretical foundations and general issues and selected specific issues for the discipline of civil engineering, geodesy and transport, in particular the properties of modern cement composites, |

| | |
|---|---|
| | mechanics and identification of structural changes during the operation of concrete structures. |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies main development tendencies for the discipline of civil engineering, geodesy and transport, in particular the development of methods for designing modern concrete structures |
| P8S_WG_c | Scope and depth – completeness of cognitive perspective and dependencies methodology of scientific research for the discipline of civil engineering and transport, in particular the development of methods for modeling and diagnostics of concrete structures |
| P8S_WK_c | Context – conditions, effects<br>- basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to these results, for the discipline of civil engineering, geodesy and transport, taking into account the economic aspects of the use of modern cement composites. |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>b) use the knowledge for the discipline of civil engineering, geodesy and transport to creatively identify, formulate and innovatively solve complex problems or perform research tasks, in particular the ability to apply the acquired knowledge in the field of cement composites in design, construction and operation. |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Evaluations – a critical approach<br>a) critical evaluation of achievements within the discipline of civil engineering, geodesy and transport, including the use of modern concretes in structures. |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | x | | | | |
| P8S_WG_b | | x | | | | |
| P8S_WG_c | | x | | | | |
| P8S_WK_c | | x | | | | |
| P8S_UW_a | | x | | | | |
| P8S_KK_a | | | | | x | |

## 6. LITERATURE

| **Basic Literature** |
|---|

1. Gołaszewski J., 2021. Projektowanie betonu samozagęszczalnego. PWN, Warszawa
2. Łukowski P., 2016. Modyfikacja materiałowa betonu. Polski Cement, Kraków.
3. Jasiczak J., Wdowska A., Rudnicki T., 2008. Betony ultrawysokowartościowe. Właściwości, technologie, zastosowania. Stowarzyszenie Producentów Cementu, Kraków.
4. Szwabowski J., Gołaszewski J., 2010. Technologia betonu samozagęszczalnego. Stowarzyszenie Producentów Cementu, Kraków.
5. Knauff M., 2018. Obliczanie konstrukcji żelbetowych według Eurokodu 2. Wydawnictwo Naukowe PWN.
6. Pędziwiatr J., 2010. Wstęp do projektowania konstrukcji żelbetowych wg PN-EN 1992-1-1:2008. Dolnośląskie Wydawnictwa Edukacyjne
7. Golubińska A., Knauff M., Knyziak P., 2014. Tablice i wzory do projektowania konstrukcji żelbetowych z przykładami obliczeń. Wydawnictwo Naukowe PWN.

**Additional Literature**

1. Brandt A.M., 2009. Cement-Based Composites. Taylor & Francis Group, London and New York.
2. Neville A. M., 2012. Właściwości betonu. Stowarzyszenie Producentów Cementu, Kraków.
3. Kurdowski W., 2010. Chemia cementu i betonu. Wydawnictwo Polski Cement, Kraków, PWN Warszawa.
4. Starosolski W., 2012, Konstrukcje żelbetowe według Eurokodu 2 i norm związanych Tom 1. Wydawnicwo Naukowe PWN.
5. Łapko A., Jensen B. Christian, 2005, Podstawy projektowania i algorytmy obliczeń konstrukcji żelbetowych. Arkady, Warszawa

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.ilgit.V |
| Item Name | **A block of subjects from the discipline of *civil engineering, geodesy and transport* to choose from: MODERN METAL STRUCTURES** |
| Course coordinator responsible for preparing the syllabus | dr inż. Rafał Tews |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15** | dr inż. Rafał Tews |

Lecture:
Stability of steel structures – numerical approach, practical use of analysis results during the design of steel structure elements
FEM analysis of steel structure elements – classic (member) and advanced (shell and spatial elements) approaches
Plastic Analysis and Design of Steel Frames
Glued steel structures – characteristics of the adhesives used, principles of shaping joints, methods of calculating glued joints,
Aluminium structures – structure characteristics, dimensioning, basic construction problems
Project exercises:
Advanced numerical analysis of FEM of a selected node of a metal structure using shell or spatial elements.

## 3. TEACHING METHODS

Lecture - 10 hours
Project exercises – 5 hours

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies a) to the extent enabling the revision of existing paradigms – the world achievement, including theoretical foundations and general issues and selected specific issues for the discipline of civil engineering and transport |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies b) main development trends for the discipline of civil engineering and transport |
| P8S_WG_c | Scope and depth – completeness of cognitive perspective and dependencies |

| | |
|---|---|
| | (c) the methodology of the research in relation to metal structures |
| P8S_WK_c | Context – conditions, effects<br>c) basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to these results, for the discipline of civil engineering and transport |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>b) use knowledge for the discipline of civil engineering and transport to creatively identify, formulate and innovatively solve complex problems or perform tasks of a research nature in relation to steel structures |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Evaluations – a critical approach<br>a) critical evaluation of achievements within the discipline of civil engineering and transport |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | x | | | |
| P8S_WG_b | | | x | | | |
| P8S_WG_c | | | x | | | |
| P8S_WK_c | | | x | | | |
| P8S_UW_a | | | x | | | |
| P8S_KK_a | | | x | | | |

## 6. LITERATURE

**Basic Literature**

1. K. Rykaluk, Zagadnienia stateczności konstrukcji metalowych, DWE 2012,
2. M. Piekarczyk, Zastosowanie technologii klejenia w metalowych konstrukcjach metalowych, PK 2013,
3. M. Gwóźdź, Konstrukcje aluminiowe. Projektowanie według Eurokodu, PK 2014
4. N. S. Trahair et al. The behaviour and design of steel structures to EC3, Taylor & Francis 2008,
5. M. Bill Wong Plastic analysis and Design od Steel Structure, BH Elsevier 2009
6. K.J. Bathe – Finite Element Procedures, Prentice Hall 2014

**Additional Literature**

1. Sz, Pałkowski, Podstawy stateczności stalowych konstrukcji prętowych, 2016,
2. Journal of Constructional Steel Research - ScienceDirect platform

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.ilgit.VI |
| Item Name | **A block of subjects from the discipline of *civil engineering, geodesy and transport* to choose from: WIND ENGINEERING** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Maciej Dutkiewicz, prof. PBŚ |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15** | dr hab. inż. Maciej Dutkiewicz, prof. PBŚ |

1. Models describing the movement of air. Circulation of the Earth's atmosphere.
2. Phenomena of flow of bodies with different geometric characteristics. Application of CFD in wind engineering. Structure of winds in the ground layer.
3. The effects of wind on objects and people. Models of wind impact on buildings.
4. Specificity of wind impact on structures (towers, masts, cooling towers, suspension and suspended bridges). Reduction of vibrations caused by wind.
5. Strong wind impacts, wind scales, vortex models,
6. Principles of wind measurements. Wind comfort. Selected issues of wind energy.

## 3. TEACHING METHODS

Lecture – 15 hours
Classes will be conducted in the form of multimedia lectures. Synchronous and asynchronous distance learning is allowed.

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies to the extent enabling the revision of existing paradigms – global achievements, including theoretical foundations and general issues and selected specific issues for the discipline of civil engineering, geodesy and transport, in particular in the field of wind engineering, wind scales, wind action on buildings. |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies main development trends for the discipline of civil engineering, geodesy and transport, in particular modeling of strong winds |
| P8S_WG_c | Scope and depth – completeness of cognitive perspective and dependencies |

| | |
|---|---|
| | methodology of scientific research for the discipline of civil engineering, geodesy and transport, including research on the impact of wind on the response of a building structure. |
| P8S_WK_c | Context – conditions, effects<br>- basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to these results, for the discipline of civil engineering, geodesy and transport, including wind engineering. |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>b) use the knowledge for the discipline of civil engineering, geodesy and transport to creatively identify, formulate and innovatively solve complex problems or perform research tasks, in particular the ability to apply the acquired knowledge in the field of wind engineering in design, construction and operation. |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Evaluations – a critical approach<br>a) critical assessment of achievements within the discipline of civil engineering, geodesy and transport, including the use of modern wind models. |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | … |
| P8S_WG_a | | x | | | | |
| P8S_WG_b | | x | | | | |
| P8S_WG_c | | x | | | | |
| P8S_WK_c | | x | | | | |
| P8S_UW_a | | x | | | | |
| P8S_KK_a | | | | | x | |

## 6. LITERATURE

**Basic Literature**

1. Flaga A., 2008, Inżynieria wiatrowa, Warszawa, Arkady.
2. Dyrbye C., Hansen S.O., 1997, Wind loads on structures, John Wiley &Sons, Baffins Lane, Chichester.
3. Holmes J.D., 2015. Wind Loading of Structures, Taylor & Francis Group, New York.
4. Simiu E., Scanlan R.H., 1996. Wind effects on structures: fundamentals and applications to design, John Wiley & Sons, New York

| Additional Literature |
| --- |
| 1. Flaga A. Mosty dla pieszych, 2011, Warszawa, Wydawnictwa Komunikacji i Łączności<br>2. Tamura Y., Kareem A.,2013, Advanced Structural Wind Engineering. |

POLITECHNIKA BYDGOSKA
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HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.im.I |
| Item Name | **A block of subjects from the discipline *of mechanical engineering* to choose from: MACHINE AND PROCESS LIFE CYCLE** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Izabela Piasecka, prof. PBŚ |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15** | dr hab. inż. Izabela Piasecka, prof. PBŚ |

1. **INTRODUCTION TO THE SUBJECT OF THE LIFE CYCLE OF MACHINES AND PROCESSES.** Basic definitions. Discussion of the stages of the life cycle of machines (formulation of needs, construction, production, operation, post-consumer development). Analysis of changes in the relationship between the economy and the environment.
2. **PROCESSES OF MANUFACTURING AND USING MACHINES IN THE CONTEXT OF THEIR LIFE CYCLE.** Utility functions of plastics, materials, elements, work units, machines and devices. The flow of matter and energy in the cycle of existence. Diagram of the course of production, operation and post-use development of machines in the context of their life cycle. Methods of environmental process assessment.
3. **LOADS INTRODUCED INTO THE ENVIRONMENT DURING THE LIFE CYCLE OF MACHINES.** Impact of industrial processes on the environment. Environmental burden as a result of the use of natural resources. Characteristics of pollutants introduced into the environment. Impact of industrial processes on the working environment.
4. **ENVIRONMENTAL IMPACTS CAUSED BY THE INTRODUCTION OF WORKLOADS INTO THE LIFECYCLE OF MACHINES.** Depletion of natural resources. Impact of pollution on human health. Climate. Degradation of the stratospheric ozone layer. Environmental pollution. Acidification and eutrophication. Effects of loads on materials. Other environmental effects (m.in. effects of noise and vibration, effects of load on the working environment).
5. **QUANTIFICATION OF THE EFFECTS OF IMPACT ON THE ENVIRONMENT IN THE LIFE CYCLE OF MACHINES.** Environmental loads that arise during the life cycle of machines. Cumulative ambient loads. Environmental interference and its effects on the environment. Methods of approach to quantification of the impact on the environment. Determination of cumulative environmental loads (including: classification and characterization of loads, methods of determining the load equivalent index, normalization and weighting of loads). Energy and environmental characteristics of machines. Determination of indicators of the category of impact on the environment.
6. **DETERMINATION OF CUMULATIVE ENVIRONMENTAL LOADS FOR THE PROCESSES OF MANUFACTURING MACHINES AND DEVICES.** Methods for

determining the cumulative workloads of your environment. Methods of process analysis. A method of a system of balance equations for a single material, material, element or work assembly and for a machine or machine park. Determine the cumulative water consumption rate.

7. **METHODOLOGY OF ENERGY AND ECOLOGICAL ANALYSES OF MACHINES FOR THE FULL LIFE CYCLE.** Principles of performing a full life cycle analysis. General information on the full life cycle methodology (including: the subject and purpose of the LCA analysis, stages and phases of the analysis, basic definitions in the LCA methodology). Defining the purpose and scope of the energy and ecological analysis. Inventory – collection of data and analysis of the set (including: calculation procedures and correction of the boundaries of the technical object's system, assignment of streams and releases, examples of data ordering procedures). Determination of the function unit and reference flux. Environmental impact assessment (including: determination of environmental impact categories, interpretation of analysis results, final report and critical review).
8. **THE ISSUE OF ENERGY AND ECOLOGICAL OPTIMIZATION OF MACHINES.** Performance properties and pro-ecological requirements for machines and equipment. A systemic approach to energy and ecological analysis (including: basic definitions, assessment criteria, system boundaries, system environment). A general formulation of the optimization problem. Possibilities to reduce the impact of the life cycle of machines on the environment (including: possibilities of impact in the design phase, impact of durability of plastics, materials and components, importance of the operating system in the consumption of resources and environmental impact, possibilities of impact on the consumption of materials, products and water).
9. **DETERMINE THE CUMULATIVE WORKLOADS OF YOUR ENVIRONMENT FOR THE FULL LIFECYCLE OF YOUR MACHINES.** Components of the environment workload. Determining the cumulative consumption of energy and non-energy resources. Determination of cumulative pollutant emissions and the amount of waste. Determining cumulative eco-cost and eco-cost.
10. **ENERGY AND ECOLOGICAL ANALYSIS OF A TECHNICAL FACILITY IN PRACTICE.** Remarks on the scope of energy and environmental analysis. Information about plastics, materials and components as well as manufacturing processes. Energy and ecological characteristics. Compilation of inventory data. Description of LCA analysis. Environmental impact assessment.
11. **COMPARATIVE ANALYSIS OF ENERGY AND ENVIRONMENTAL PERFORMANCE ON SELECTED EXAMPLES OF PLASTICS, MATERIALS, ELEMENTS, WORKING UNITS AND MACHINES.** Function unit and reference flux specifying. General principles of comparing plastics, materials, elements, working units and machines. Description of manufacturing processes. Notes on inventory and data acquisition. Energy and ecological characteristics and ways of comparing results. Discussing the results of the analysis.
12. **ENVIRONMENTAL DECLARATIONS.** Types of environmental declarations and general rules for their preparation. Type I, II and III environmental labels (including: basic rules of implementation, more important procedures required, participation of stakeholders in the preparation of declarations, methods of sharing, institutional bases for the functioning of the environmental declaration system).
13. **DIRECTIONS OF PRO-ECOLOGICAL MODERNIZATION OF MACHINES.** Sustainability strategy as a leading concept. Sustainability tools in the manufacture of plastics, materials, components, work assemblies and machines (including: integrated permits and best

available technology, environmental management, cleaner production principle). Possibilities of pro-ecological rationalization of machines in their life cycle (including: rational management of waste and post-consumer resources). Pro-ecological rationalization of energy production and use (including: increasing the efficiency of current energy technologies, improving environmental indicators in modern technologies, introducing new energy technologies, increasing the share of energy from renewable sources, rationalization of energy use).

14. **ECO-FRIENDLY DESIGN AND MACHINE DEVELOPMENT.** Tools for computer-aided eco-design of machines and devices. Characteristics of the GaBi software. Sustainable design capabilities in SolidWorks Sustainability. Procedure for conducting LCA analyses using the SimaPro tool.
15. **THE IDEA OF A CIRCULAR ECONOMY.** Introduction and key definitions. A closed way of managing the proximity to natural ecosystems. Examples of activities that bring management closer to a closed system.

## 3. TEACHING METHODS

Lecture - 15 hours
Multimedia lecture - discussion

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies: a) to the extent enabling the revision of existing paradigms – global achievements, including theoretical foundations and general issues and selected specific issues specific to the discipline of mechanical engineering, in particular in the field of assessment of the life cycle of machines and devices and the possibilities of their eco-design and development. |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies: b) the main development trends of the discipline of mechanical engineering, with particular emphasis on the issues of pro-ecological modernization of machines and the idea of circular economy. |
| P8S_WG_c | Scope and depth – completeness of cognitive perspective and dependencies: (c) the methodology for mechanical engineering research, including Life Cycle Assessment (LCA). |
| P8S_WK_c | Context – conditions, effects:<br>c) basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to these results in relation to mechanical engineering, in particular in the area of pro-ecological design and optimization of machines and increasing energy, economic and ecological efficiency at various stages of their life cycle. |
| SKILLS: can | |
| P8S_UW_a | Use of knowledge – problems solved and tasks performed:<br>a) use knowledge in the field of mechanical engineering to creatively identify, formulate and innovatively solve complex problems or perform |

| | |
|---|---|
| | research tasks, with particular emphasis on the issues of life cycle assessment of machines and equipment, their environmentally friendly modernization, sustainable development and circular economy. |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Assessments – a critical approach:<br>a) critical evaluation of achievements within the discipline of mechanical engineering, including environmental life cycle assessment (LCA), eco-design, modernization and development of machinery and equipment, in line with the assumptions of circular economy and sustainable development. |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | x | | x | |
| P8S_WG_b | | | x | | x | |
| P8S_WG_c | | | x | | x | |
| P8S_WK_c | | | | | x | |
| P8S_UW_a | | | x | | x | |
| P8S_KK_a | | | | | x | |

## 6. LITERATURE

**Basic Literature**

1. Flizikowski J.B., 2002: Rozprawa o konstrukcji, Wyd. Instytutu Technologii Eksploatacji.
2. Kłos Z., Kurczewski P., Kasprzak J., 2005: Środowiskowe charakteryzowanie maszyn i urządzeń, Wydawnictwo Politechniki Poznańskiej.
3. Górzyński J., 2007: Podstawy analizy środowiskowej wyrobów i obiektów, WNT, Warszawa.
4. Guineé J., 2002: Handbook on Life Cycle Assessment. Operational Guide to the ISO Standards, Springer Science + Business Media B.V.
5. Lewandowska A.,2006: Środowiskowa ocena cyklu życia produktu na przykładzie wybranych typów pomp przemysłowych, Wyd. Akademii Ekonomicznej w Poznaniu.

**Additional Literature**

1. Curran M.A., 2015: Life Cycle Assessment Student Handbook, John Wiley&Sons Inc.
2. Flizikowski J., Bieliński K., 2000: Projektowanie środowiskowych procesorów energii, Wydawnictwa Uczelniane Akademii Techniczno-Rolniczej, Bydgoszcz.
3. Klöpffer W., Grahl B., 2014: Life Cycle Assessment (LCA): A Guide to Best Practice. John Wiley&Sons Inc.
4. Legutko S., 2007: Eksploatacja maszyn, Wydawnictwo Politechniki Poznańskiej.
5. Merkisz-Guranowska, A., 2007: Recykling samochodów w Polsce, Wyd. Instytutu Technologii Eksploatacji.

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.im.II |
| Item Name | **A block of subjects in the discipline of *mechanical engineering* to choose from: SYSTEMS ENGINEERING** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Łukasz Muślewski, prof. PBŚ |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15*** | dr hab. inż. Łukasz Muślewski, prof. PBŚ |

The subject is carried out in the discipline: mechanical engineering.
The thematic scope of the classes includes:
- introduction to general systems theory,
- analysis of the concept and definition of systems,
- characteristics of issues in the field of systems engineering,
- identification of the purpose of the system,
- system construction,
- system structure,
- a set of system elements,
- system decomposition,
- assessment of the condition and behavior of the system,
- analysis and synthesis of the system,
- division and characteristics of system models,
- characteristics of the system environment.

## 3. TEACHING METHODS

Lecture – 15 hours
The subject is carried out in the form of a lecture.

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | The student has the knowledge to revise the existing paradigms in the field of general systems theory, and in particular knows the world achievements including theoretical foundations and general issues and selected specific issues concerning the functioning of technical systems. |
| P8S_WG_b | The student knows and understands the main development trends in the construction and operation of complex technical systems. |

| | |
|---|---|
| P8S_WG_c | The student has knowledge of the methodology of scientific and engineering research in the field of construction and evaluation of the performance of technical systems. |
| P8S_WK_c | The student knows and understands the basic principles of knowledge transfer to the economic and social sphere and the commercialization of the results of scientific activity and the know-how related to these results in relation to the functioning of technical systems. |
| SKILLS: can | |
| P8S_UW_a | The student is able to use knowledge from various fields of science to creatively identify, formulate and innovatively solve complex problems or perform research tasks in relation to the construction and functioning of complex technical systems. He/she is able to define the purpose and object of scientific research, formulate a research hypothesis, develop research methods, techniques and tools and creatively apply them, draw conclusions based on the results of scientific research. |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | The student is ready to critically evaluate the achievements within a given research discipline and solutions in the field of general theory of technical systems. |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | x | | | |
| P8S_WG_b | | | x | | | |
| P8S_WG_c | | | x | | | |
| P8S_WK_c | | | x | | | |
| P8S_UW_a | | | x | | | |
| P8S_KK_a | | | x | | | |

## 6. LITERATURE

**Primary Literature**

1. Weinberg G.M., Myślenie systemowe. Wydawnictwo Naukowo-Techniczne, Warszawa 1979.
2. Praca zbiorowa pod redakcją G.J. Klira, Ogólna teoria systemów. Wydawnictwo Naukowo-Techniczne, Warszawa 1976.
3. Woropay M., Muślewski Ł., Jakość w ujęciu systemowym. Instytut Technologii Eksploatacji, Radom 2005.
4. Sage A.P., System engineering. Willey, New York 1992.
5. Sienkiewicz P., Inżynieria systemów. Wydawnictwo Ministerstwa Obrony Narodowej, Warszawa 1983.

| Additional literature |
| --- |
| 1. Benes J., Teoria systemów. Państwowe Wydawnictwo Naukowe, Warszawa 1979.<br>2. Szymański J.M., Życie systemów. WiedzaPowszechna, Warszawa 1991.<br>3. Oliver D.W. Engineering complex systems with models and objects.McGraw-Hill, New York 1997.<br>4. Kazimierczak J., System cybernetyczny. Wiedza Powszechna, Warszawa 1978.<br>5. Ziemba S., Jarominek W., Staniszewski R., Problemy teorii systemów. Zakład Narodowy imienia Ossolińskich – Wydawnictwo, Wrocław 1980. |

POLITECHNIKA BYDGOSKA
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HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.im.III |
| Item Name | **A block of subjects from the discipline of *mechanical engineering* to choose from: MATERIALS SCIENCE** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Dariusz Sykutera, prof. PBŚ |

## 1. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15*** | dr hab. inż. Dariusz Sykutera, prof. PBŚ |

*- subject taught separately in a group of disciplines

Introduction to materials science – world data, classification. Microstructure and Consistency of Materials. Elasticity, ductility, stiffness and strength of materials. Mechanical strength and fracture toughness. Creep phenomenon. Thermal properties of materials. Shaping material properties. Hybrid composites. Lightweight construction materials. Material selection strategies in eco-design using the CES (Cambridge) base.

## 2. TEACHING METHODS

Lecture – 15 hours of lecture, synchronous distance learning

## 3. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies: a) to the extent that allows for the revision of existing paradigms – the world achievements, including theoretical foundations and general issues and selected specific issues specific to materials science. |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies: b) the main development trends in the field and construction of single- and multi-phase materials, especially structural materials. |
| P8S_WG_c | Scope and depth – completeness of cognitive perspective and dependencies: c) methodology of scientific research in the field of materials testing. |
| P8S_WK_c | Context – conditions, effects: c) basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to these results in relation to the production and testing of single- and multi-phase materials. |

| | |
|---|---|
| SKILLS: can | |
| P8S_UW_a | Use of knowledge – problems solved and tasks performed:<br>a) use knowledge in the field of materials science to creatively identify, formulate and innovatively solve complex problems or perform research tasks. |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Assessments – a critical approach:<br>a) critical evaluation of achievements in materials science. |

## 4. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | x | | | |
| P8S_WG_b | | | x | | | |
| P8S_WG_c | | | | | x | |
| P8S_WK_c | | | | | x | |
| P8S_UW_a | | | | | x | |
| P8S_KK_a | | | | | x | |

## 5. LITERATURE

**Basic Literature**

1. Callister Jr. W. D., Rethwisch D. G.: Materials Science and Engineering: An Introduction 9th Edition. WileyPLUS. 2022.
2. Miodownik M. Stuff Matters: Exploring the Marvelous Materials that Shape Our Man-Made World. Amazon. New York 2021.
3. Ashby M., Cebon D., Shercliff H., Ashby M. F.: Inżynieria materiałowa, Tom 1-2. Wydawnictwo Galaktyka, 2011.

**Additional Literature**

1. Dobrzański L.A.: Podstawy nauki o materiałach i metaloznawstwo. WNT, Warszawa 2002.
2. Blicharski M.: Inżynieria materiałowa. Wydawnictwo Naukowe PWN. Warszawa 2017.
3. Kubiński W.: Materiałoznawstwo, Tom 1. Podstawowe materiały stosowane w technice. Wydawnictwo naukowe AGH, Kraków 2012.

POLITECHNIKA BYDGOSKA
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HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.im.IV |
| Item Name | **A block of subjects from the discipline of *mechanical engineering* to choose from:**<br>**ANALYTICAL MECHANICS** |
| Course coordinator responsible for preparing the syllabus | prof. dr hab. inż. Dariusz Skibicki |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15*** | prof. dr hab. inż. Dariusz Skibicki |

*- subject taught separately in a group of disciplines

Newtonian mechanics vs. analytical mechanics. Mathematical basis: calculus of variations. Degrees of freedom. Referential. Generalized coordinates. Generalized forces. Virtual Shift. D'Alebert's principle. The principle of virtual work. Derivation of the Lagrange equation. Lagrange mechanics. Operation and its minimization. Hamiltonian mechanics: Hamiltonian equations.

## 3. TEACHING METHODS

Lecture - 15 hours

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies:<br>a) to the extent that it is possible to understand and revise the existing paradigms of classical mechanics, i.e. Newtonian, Lagrange and Hamiltonian mechanics. |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies:<br>b) the main historical tendencies in the development of classical mechanics |
| P8S_WG_c | Scope and depth – completeness of cognitive perspective and dependencies:<br>c) methodology of scientific research in the field of mechanical engineering. |
| P8S_WK_c | Context – conditions, effects:<br>c) possible principles of transfer of knowledge in the field of mechanics to the economic and social sphere and commercialization of the results of scientific activity |
| SKILLS: can | |
| P8S_UW_a | Use of knowledge – problems solved and tasks performed: |

| | |
|---|---|
| | a) use knowledge of classical mechanics to creatively identify, formulate and innovatively solve complex problems |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Assessments – a critical approach:<br>a) critical evaluation of achievements within a given discipline of mechanical engineering in the field of problems of classical mechanics. |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | x | | | |
| P8S_WG_b | | | x | | | |
| P8S_WG_c | | | x | | | |
| P8S_WK_c | | | x | | | |
| P8S_UW_a | | | x | | | |
| P8S_KK_a | | | x | | | |

## 6. LITERATURE

**Basic Literature**

1. Janusz Zachwieja. Wykłady z mechaniki analitycznej. Wydawnictwa uczelniane Uniwersytetu Technologiczno-Przyrodniczego w Bydgoszczy, 2016.
2. Jan Awrajcewicz. Mechanika techniczna. Wydawnictwa Naukowo-Techniczne, 2009.

**Additional Literature**

1. Patrick Hamill. A Student's Guide to Lagrangians and Hamiltonians. Cambridge University Press, 2014.
2. Susskind Leonard, Friedman Art. Mechanika kwantowa. Teoretyczne minimum. Prószyński Media. 2016.

POLITECHNIKA BYDGOSKA
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HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.im.V |
| Item Name | **A block of subjects from the discipline of *mechanical engineering* to choose from:**<br>**FINITE ELEMENT METHOD** |
| Course coordinator responsible for preparing the syllabus | prof. dr hab. inż. Dariusz Skibicki |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15*** | prof. dr hab. inż. Dariusz Skibicki |

*- subject taught separately in a group of disciplines

Lecture 1. Introduction to FEM.
The idea of a finite element. Stiffness matrix. Matrix aggregation. Solving a system of equations with respect to displacement. Shape function. Calculation of strains and stresses. Preprocessor, solver, and postprocessor. Types of FEM analyses.

Lecture 2. Basics of matrix calculus and solid state mechanics.
Types of matrices and operations on matrices. Form and volume deformation. Stress. Hook's Law.

Lecture 3 and 4. Member element.
A single item. Stiffness matrix. Shape function. Determination of deformations. Stress determination. Many elements. Matrix aggregation. Boundary conditions. Solving the Block FEM Equation. Discretization error. Any position of the elements. Transformation of the stiffness matrix.

Lecture 5. Triangular element
Displacement. Shape features. Strain. Hook's Law. Stiffness matrix.

Lecture 6. Quadrangular element
Displacement. Iso-parametric transformation. Hook's Law. Determination of deformations and stresses. Stiffness matrix of the iso-parametric element. The effect of the shape of the element on accuracy. Measures of component quality.

Lecture 7. Methods for solving the FEM task
Newton's method and derived methods. Dynamics in FEM. Explicit method.

## 3. TEACHING METHODS

| |
|---|
| Lecture – 15 hours<br>Lecture - classes are conducted in the form of a lecture. The lecture is enriched with presentations of practical aspects of FEM in the Fusion program. |

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies:<br>a) to the extent that it is possible to revise the existing paradigms of mechanical engineering in relation to numerical methods, in particular the finite element method. |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies:<br>b) the main development tendencies of the discipline of mechanical engineering, especially computational methods, including the finite element method |
| P8S_WG_c | Scope and depth – completeness of cognitive perspective and dependencies:<br>c) methodology of conducting scientific research in the field of mechanical engineering, especially computational methods |
| P8S_WK_c | Context – conditions, effects:<br>c) basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of numerical calculations in the field of solid state mechanics |
| SKILLS: can | |
| P8S_UW_a | Use of knowledge – problems solved and tasks performed:<br>a) use knowledge of mechanical engineering to creatively identify, formulate, and innovatively solve complex solid state mechanical problems |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Assessments – a critical approach:<br>a) critical evaluation of achievements within the discipline of mechanical engineering, especially numerical methods in relation to solid state mechanics. |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | x | | | |
| P8S_WG_b | | | x | | | |
| P8S_WG_c | | | x | | | |
| P8S_WK_c | | | x | | | |
| P8S_UW_a | | | x | | | |
| P8S_KK_a | | | x | | | |

## 6. LITERATURE

| Basic Literature |
| --- |
| 1. Skibicki Dariusz, Nowicki Krzysztof. Metody numeryczne w budowie maszyn, Wydawnictwa Uczelniane Akademii Techniczno-Rolniczej w Bydgoszczy, 2006.<br>2. Gustaw Rakowski, Zbigniew Kacprzyk. Metoda elementów skończonych w mechanice konstrukcji. Oficyna Wydawnicza Politechniki Warszawskiej, 2016. |
| **Additional Literature** |
| 1. David V. Hutton. Fundamentals of Finite Element Analysis, McGraw-Hill Science/Engineering/Math, 2003.<br>2. Daryl L. Logan. A First Course in the Finite Element Method. Cl Engineering, 2016. |

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.im.vi |
| Item Name | **A block of subjects from the discipline *of mechanical engineering* to choose from: THEORY OF ELASTICITY AND PLASTICITY** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Łukasz Pejkowski, prof. PBŚ |

## 2. DIVISION INTO SEMESTERS, NUMBER OF HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15*** | dr hab. inż. Łukasz Pejkowski, prof. PBŚ |

*- subject taught separately in a group of disciplines

The program content is divided into the following topics:

1. Physical mechanisms of material deformation.
2. Elements of the mechanics of continuous media. Stress state and strain state.
3. Basic equations of linear theory of elasticity.
4. Experimental observations.
5. Ductility in uniaxial stress state.
6. Strain hypotheses.
7. General constitutive rights. Plasticity surface, plastic potential, associated plastic flow.
8. Isotropic hardening model.
9. Kinematic reinforcement model.
10. Influence of strain velocity on constitutive behavior of materials.

## 3. TEACHING METHODS

Lecture - 15 hours
Multimedia lecture

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies: a) to the extent that allows for the revision of the existing paradigms of mechanics – including theoretical foundations and general issues and selected |

| | |
|---|---|
| | specific issues of the theory of elasticity and plasticity of engineering materials. |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies:<br>b) the main developmental tendencies of the theory of elasticity and, above all, plasticity, including cyclic plasticity |
| P8S_WG_c | Scope and depth – completeness of cognitive perspective and dependencies:<br>c) methodology of scientific research conducted in the field of the theory of elasticity and plasticity, especially cyclic used in modeling fatigue processes. |
| P8S_WK_c | Context – conditions, effects:<br>c) basic principles of knowledge transfer to the economic and social sphere and commercialization of results obtained by methods specific to the theory of elasticity and plasticity |
| SKILLS: can | |
| P8S_UW_a | Use of knowledge – problems solved and tasks performed:<br>a) use knowledge in the field of mechanical engineering to creatively identify, formulate and innovatively solve complex problems or perform research tasks in the field of the theory of elasticity and plasticity |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Assessments – a critical approach:<br>a) critical evaluation of achievements in the field of basic issues of the theory of elasticity and plasticity |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | x | | | |
| P8S_WG_b | | | x | | | |
| P8S_WG_c | | | x | | | |
| P8S_WK_c | | | x | | | |
| P8S_UW_a | | | x | | | |
| P8S_KK_a | | | x | | | |

## 6. LITERATURE

**Basic Literature**

1. Jean Lemaitre, Jean-Louis Chaboche, Mechanics of Solid Materials, Cambridge University Press, 1990
2. L.S. Srinath, Advanced Mechanics of Solids, McGraw-Hill, 2009
3. Akhtar S. Khan, Sujian Huang, Continuum Theory of Plasticity, John Wiley & Sons, 1995
4. J. Chakrabarty, Theory Of Plasticity, Elsevier Butterworth-Heinemann, 2006
5. Stephen P. Timoshenko, J. N. Goodier, Theory of Elasticity, McGraw-Hill, 1970

| Additional Literature |
| --- |
| 1. Michał Życzkowski, Obciążenia złożone w teorii plastyczności, PWN, 1973<br>2. Andrzej Gawęcki, Mechanika materiałów i konstrukcji prętowych, Politechnika Poznańska, 2003 |

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.itita.I |
| Item Name | **Block of subjects in the discipline of *information and communication technology* to choose from: EFFICIENT ENERGY CONVERSION IN AGRICULTURAL TECHNOLOGY** |
| Course coordinator responsible for preparing the syllabus | prof. dr hab. inż. Leszek Szychta |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15** | prof. dr hab. inż. Leszek Szychta |
| Introduction to industrial process automation. Industrial automation components. Energy Efficiency Act. Losses in the water supply system and characteristics of the pumping system. Flow characteristics and pump efficiency. Pump efficiency characteristics for different heads. Control of the pump system by throttling. Cascade, inverter and optimal control principle and the effect on energy efficiency. Control quality factor in the energy efficiency assessment. | | |

## 3. TEACHING METHODS

Lecture – 15 hours
Classes conducted in the form of a lecture.

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Knows and understands to the extent that allows the revision of existing paradigms in the field of global achievements, including theoretical issues and the possibilities of their implementation and selected specific issues in the field of rational energy management in agricultural technology in the scientific disciplines of technical informatics and telecommunications as well as automation, electronics, electrical engineering and space technologies |
| P8S_WG_b | Knows and understands the direction of development of scientific research in the field of energy efficiency in the scientific disciplines of technical informatics and telecommunications as well as automation, electronics, electrical engineering and space technologies |
| P8S_WG_c | Knows the methodology of scientific research in the field of known control systems in devices used in agricultural technology in the field of scientific |

| | |
|---|---|
| | disciplines: technical informatics and telecommunications as well as automation, electronics, electrical engineering and space technologies |
| P8S_WK_c | Knows the principles of knowledge transfer in the field of effective application of modern energy management solutions to the economic sphere through the commercialization of the results of scientific activity in the following scientific disciplines: technical computer science and telecommunications as well as automation, electronics, electrical engineering and space technologies |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>Is able to independently solve problems in the field of energy-efficient control of equipment in the field of agricultural technology by using knowledge from various fields of science, formulating and innovative solving of complex interdisciplinary problems affecting the preservation of biodiversity or performing other complex research tasks in scientific disciplines: technical informatics and telecommunications as well as automation, electronics, electrical engineering and space technologies |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Is ready to undertake a thorough analysis of research processes occurring in the field of control systems, taking into account the broadly understood impact on the environment, critically evaluates the achievements within the scientific disciplines: technical informatics and telecommunications as well as automation, electronics, electrical engineering and space technologies |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | x | | | |
| P8S_WG_b | | | x | | | |
| P8S_WG_c | | | | | x | |
| P8S_WK_c | | | | | x | |
| P8S_UW_a | | | | | x | |
| P8S_KK_a | | | | | x | |

## 6. LITERATURE

**Basic Literature**

1. Turowski J.: Podstawy mechatroniki, WSHE, 2008.
2. Jaszczuk W. i inni: Mikrosilniki elektryczne. Badanie właściwości statycznych i dynamicznych. PWN, Warszawa, 1991.
3. Turowski J.: Elektromaszynowe elementy automatyki. Politechnika Łódzka, Łódź, 1989
4. Olszewski M (redakcja): Podstawy mechatroniki, Rea, 2006
5. Gardner J.W., Varadan V. K., Awadelkarim O.O.: Microsensors MEMS and Smart Devices. J.Wiley, 2001

| Additional Literature |
| --- |
| 1. Jędral W. Pompy wirowe, OWPW,2014,<br>2. Pump Life Cycle Costs: A guide to LCC Analysis for pumping systems, Europump and Hdraulic Institute,<br>3. Viholainen J., Energy efficient control strategies for variable driven pumping systems based on pump operation point monitoring with frequency converters, Acta Universitas Lappeenrantaensis2014. |

POLITECHNIKA BYDGOSKA
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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.itit.II |
| Item Name | **Block of subjects in the discipline of *information and communication technology* to choose from: DIGITAL SIGNAL PROCESSING** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Rafał Długosz, prof. PBŚ |

## 3. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15** | dr hab. inż. Rafał Długosz, prof. PBŚ |

Sampling process. The process of quantizing. Transformata Z. Finite impulse response filters (FIR. Infinite Impulse Response (IIR) filters. Differential equation of the filter. Filter transmittance. Frequency characteristics of the filter. Low-, high-, mid-pass and mid-stop filters. Non-linear filters (erosion, expansion joint, median). Morphological operations. Designing filters. Ways to implement filters. Implementation inaccuracies of FIR filter coefficients and their impact on frequency responses. The use of filters in industrial applications, medicine and scientific research. Programs for the analysis and simulation of various signal processing techniques.

## 4. TEACHING METHODS

Lectures – 15 hours

## 5. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Knows and understands the structure and principle of operation of signal processing methods and algorithms |
| P8S_WG_b | Knows and understands modern trends related to the development of digital signal processing methods and knows programs for the implementation of selected algorithms in this area and their research |
| P8S_WG_c | Knows and understands the possibilities of using signal processing methods in industry, medicine and scientific research |
| P8S_WK_c | Context – conditions, effects<br>c) basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to these results |
| SKILLS: can | |
| P8S_UW_a | Can design a selected digital filter for given parameters. |

| SOCIAL COMPETENCE: is ready to | |
|---|---|
| P8S_KK_a | He is ready to critically analyze the results of his research |

## 6. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | x | | | | | |
| P8S_WG_b | x | | | | | |
| P8S_WG_c | x | | | | | |
| P8S_WK_c | | | | x | | |
| P8S_UW_a | | | | x | | |
| P8S_KK_a | | | | | x | |

## 7. LITERATURE

**Basic Literature**

1. Tomasz P. Zieliński, Cyfrowe przetwarzanie sygnałów, Od teorii do zastosowań, Wydawnictwa Komunikacji i Łączności (WKŁ), Warszawa 2005, 2021
2. Gérard Blanchet, Maurice Charbit, Digital signal and image processing using MATLAB, ISTE Ltd, 2006
3. Adam Dąbrowski (red.), Przetwarzanie sygnałów przy użyciu procesorów sygnałowych, Wydawnictwo Politechniki Poznańskiej, 1998, 2000

**Additional Literature**

1. Gaurav Sharma, Digital Color Imaging Handbook, CRC Press 2003

POLITECHNIKA BYDGOSKA
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HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.itit.III |
| Item Name | **Block of subjects in the discipline of *information and communication technology* to choose from: ARTIFICIAL INTELLIGENCE AND MODERN METHODS OF DATA PROCESSING IN SCIENTIFIC RESEARCH** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Tomasz Talaśka, prof. PBŚ<br>prof. dr hab. inż. Michał Choraś |

## 3. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **30** | dr hab. inż. Tomasz Talaśka, prof. PBŚ<br>prof. dr hab. inż. Michał Choraś |

Artificial Intelligence, Algorithms, methods and techniques of artificial intelligence. Artificial neural networks, genetic algorithms, expert systems, fuzzy systems, fuzzy neural networks, machine learning, swarming systems, metaheuistic algorithms. Methods of implementing artificial intelligence algorithms. The use of artificial intelligence in industrial applications, medicine and scientific research. Data filtration and security. Programs for the analysis and simulation of various artificial intelligence techniques.

## 4. TEACHING METHODS

Lectures – 15 hours, project exercises – 15 hours.

## 5. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Knows and understands the structure and principle of operation of artificial intelligence algorithms |
| P8S_WG_b | Knows and understands modern trends related to artificial intelligence and data processing, and knows programs for the implementation of selected algorithms and their research |
| P8S_WG_c | Knows and understands the possibilities of using artificial intelligence in industry, medicine and scientific research |
| P8S_WK_c | Context – conditions, effects<br>c) basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to these results |
| SKILLS: can | |
| P8S_UW_a | Can model a selected object, phenomenon or process using artificial intelligence algorithms |

| SOCIAL COMPETENCE: is ready to | |
|---|---|
| P8S_KK_a | He is ready to critically analyze the results of his research |

## 6. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | x | | | | | |
| P8S_WG_b | x | | | | | |
| P8S_WG_c | x | | | | | |
| P8S_WK_c | | | | x | | |
| P8S_UW_a | | | | | x | |
| P8S_KK_a | | | | | x | |

## 7. LITERATURE

**Basic Literature**

1. Leszek Rutkowski, Metody i techniki sztucznej inteligencji, Wydawnictwo Naukowe PWN, 2021
2. Aurelien Geron, Uczenie maszynowe z użyciem Scikit-Learn I TensorFlow, Helion, 2020
3. Aglae Bassens, Grant Beyleveld, Jon Krohn, Uczenie głębokie i sztuczna inteligencja, Helion, 2021

**Additional Literature**

1. Adam Niewiadomski, Zbiory rozmyte typu 2 : zastosowania w reprezentowaniu informacji, Exit, 2019
2. Maciej Piliński , Danuta Rutkowska , Leszek Rutkowski, Sieci neuronowe, algorytmy genetyczne i systemy rozmyte, PWN, 1999
3. Kamila Migdał Najman, Krzysztof Najman, Samouczące się sztuczne sieci neuronowe w grupowaniu i klasyfikacji danych. Teoria i zastosowania w ekonomii, ebook, 2013

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.itit.IV |
| Item Name | **Block of subjects in the discipline of *information and communication technology* to choose from: MANAGING THE OPERATION OF CURRENT AND FUTURE ENERGY SYSTEMS** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Sławomir Cieślik, prof. PBŚ |

## 3. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15** | dr hab. inż. Sławomir Cieślik, prof. PBŚ |

Energy in satisfying human needs, especially in the lowest layer of Maslow's pyramid. The essence of heat and electricity in everyday life. Modern systems for generating, transmitting, storing and converting energy. Concepts of energy systems in the absence of fossil fuels. Trajectories of the transformation of current energy systems to the postulated systems by 2050.
The essence of managing the operation of energy systems. Limitations resulting from the physics of energy systems. Energy efficiency in energy processing, transmission and storage. Maximize the use of renewable energy sources. The use of artificial intelligence in the processes of managing the operation of energy systems.
Mathematical modeling of power system operating states and real-time digital simulation. The method of electric poles (steady and transient states). Examples of applications in the GNU Octeve environment. Examples of the use of digital simulators working in real time in the process of managing the operation of power systems.

## 4. TEACHING METHODS

The classes are conducted in the form of a lecture containing a demonstration of creating applications in the GNU Octave environment.
As part of your own work, you should solve a given problem (own task) and present the results in the form of a report.
The lecture is credited on the basis of a written colloquium. In addition, the report on the performance of the own task is evaluated. In order to pass the course, it is necessary to pass the colloquium and positively evaluate the report.

## 5. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Knows the paradigms of the importance of energy for humanity and understands the need to manage the operation of energy systems, especially in the absence of fossil fuels. |

| | |
|---|---|
| P8S_WG_b | Understands the need for the development of breakthrough innovations in the sectors of broadly understood energy processes. |
| P8S_WG_c | Knows selected methods of mathematical modeling and understands simple ways of their application used in contemporary scientific research in the field of management of energy systems. |
| P8S_WK_c | Knows and understands the need to use advanced simulation methods in the economic and social spheres related to the management of power systems. |
| SKILLS: can | |
| P8S_UW_a | Can effectively and responsibly apply knowledge from the methods of mathematical modeling of power systems to the creative development of innovative solutions of a breakthrough nature in the field of power system operation management. |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | He is ready to evaluate the solutions proposed in the literature based on interdisciplinary scientific achievements (technical information technology and telecommunications as well as automation, electronics, electrical engineering and space technologies). |

## 6. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Report on own task | Discussion | Academic Essay |
| P8S_WG_a | | | x | | | |
| P8S_WG_b | | | x | | | |
| P8S_WG_c | | | x | x | | |
| P8S_WK_c | | | x | | | |
| P8S_UW_a | | | | x | | |
| P8S_KK_a | | | | x | | |

## 7. LITERATURE

**Basic Literature**

1. Paska J., Wytwarzanie rozproszone energii elektrycznej i ciepła. Oficyna Wydawnicza Politechniki Warszawskiej, 2010.
2. Horyński M.B., Energooszczędne zautomatyzowane systemy zarządzania energią w budynkach mieszkalnych. Politechnika Lubelska, 2015.
3. Cieślik S., Mathematical Modeling of the Dynamics of Linear Electrical Systems with Parallel Calculations. Energies, 14, 2930, 2021 (https://doi. org/10.3390/en14102930).

**Additional Literature**

1. Kaproń H., Kaproń T., Efektywność wytwarzania i dostawy energii w warunkach rynkowych. Kaprint, 2016.

2. Freris L., Infield D., Renewable Energy in Power Systems. WILEY John Wiley & Sons, 2008.

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.itit.V |
| Item Name | **Block of subjects in the discipline of *information and communication technology* to choose from: PROJECT, TEAM AND SOCIAL COMMUNICATION MANAGEMENT** |
| Course coordinator responsible for preparing the syllabus | prof. dr hab. inż. Michał Choraś |

## 3. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **30** | prof. dr hab. inż. Michał Choraś / dr hab. inż. Witold Hołubowicz, prof. PBŚ |

The subject concerns the so-called soft skills.
The principles of communication (oral, written), teamwork and cooperation, work in a multicultural environment, as well as the principles of project and team management (including research) will be presented.
Tips will be presented on effective presentations, organizing effective meetings, sending e-mails, effective negotiations, and communication in a multicultural environment.
The principles of project management, including research projects, will be presented. Agile methodologies will also be discussed.
Practical situations and examples from real projects, in particular research projects, will be discussed.

## 4. TEACHING METHODS

Seminar – 15 hours
Seminar and project elements. Some classes are possible in a remote, asynchronous form.

## 5. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies a) to the extent enabling the acquisition of IT project management skills |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies b) to the extent enabling the acquisition of communication and teamwork skills during the implementation of projects |

| | |
|---|---|
| P8S_WG_c | Context – conditions, effects<br>c) methodology of scientific research in the scientific disciplines of technical informatics and telecommunications as well as automation, electronics, electrical engineering and space technologies |
| P8S_WK_c | Context – conditions, effects<br>c) basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to these results in the scientific disciplines of technical informatics and telecommunications as well as automation, electronics, electrical engineering and space technologies |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) use knowledge from various fields of science to creatively identify, formulate and innovatively solve complex problems or perform research tasks in projects in the scientific disciplines of technical informatics and telecommunications as well as automation, electronics, electrical engineering and space technologies |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Evaluations – a critical approach<br>a) critical evaluation of achievements within the scientific disciplines of technical informatics and telecommunications as well as automation, electronics, electrical engineering and space technologies |

## 6. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Oral exam | Written exam | Presentation | Discussion | Academic Essay |
|---|---|---|---|---|---|
| P8S_WG_a | | | X | | |
| P8S_WG_b | | | X | | |
| P8S_WG_c | | | X | | |
| P8S_WK_c | | | X | | |
| P8S_UW_a | | | X | | |
| P8S_KK_a | | | X | | |

## 7. LITERATURE

| **Basic Literature** |
|---|
| - |
| **Additional Literature** |
| - |

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.nch.I |
| Item Name | **A block of subjects from the discipline of *chemical sciences* to choose from:**<br>**TECHNICAL THERMODYNAMICS** |
| Course coordinator responsible for preparing the syllabus | dr Jacek Siódmiak |

## 1. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **30*** | dr Jacek Siódmiak |

*- subject taught separately in a group of disciplines

Thermodynamic system and state parameters: intensive and extensive state parameters, zero law of thermodynamics, concepts of heat and work and their relationship with energy, basics of balancing.
Thermodynamic factors and equation of state: ideal gas, ideal and semi-perfect gas, equation of state of real gas.
Specific heat: specific heat of ideal gases, heat capacity, specific heat-temperature dependency and average specific heat.
First law of thermodynamics: conservation of energy, internal energy, enthalpy.
First law of thermodynamics for closed and open systems, internal energy and enthalpy as state functions.
Thermodynamic transformations; characteristic transformations of ideal and semi-ideal gases, reversible and irreversible transformations.
Thermodynamic cycles: the concept of cycle, types of cycles, energy efficiency of the cycle.
Second law of thermodynamics: formulation of the second law of thermodynamics and concept of entropy, reversible Carnot cycle, thermodynamic temperature scale.

## 2. TEACHING METHODS

Lecture – 15 hours

Multimedia lecture, classes with the use of computer applications/simulations, seminar

## 3. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies |

| | |
|---|---|
| | a) to the extent that allows for the revision of existing paradigms – the world achievement, including theoretical foundations and general issues and selected specific issues in the field of thermodynamic processes specific to chemical and technical sciences |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies<br>b) the main development trends of the discipline of chemical sciences, in particular in the field of the efficiency of thermodynamic processes |
| P8S_WG_c | Context – conditions, effects<br>c) methodology of scientific research in chemical sciences, in particular thermodynamic processes based on the basic laws of physics, |
| P8S_WK_c | Context – conditions, effects<br>c) basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to these results in the field of chemical sciences, in particular in the field of improving the efficiency of thermodynamic processes, |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) use knowledge of thermodynamic processes to creatively identify, formulate and innovatively solve complex problems or perform research tasks in the field of chemical and technical sciences |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Evaluations – a critical approach<br>a) critical evaluation of the achievements and media reports on innovative solutions in the field of processes and technical devices in which thermodynamic processes take place |

## 4. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | | x | x | |
| P8S_WG_b | | | | x | x | |
| P8S_WG_c | | | | x | x | |
| P8S_WK_c | | | | x | x | |
| P8S_UW_a | | | | x | x | |
| P8S_KK_a | | | | x | x | |

## 5. LITERATURE

**Basic Literature**

1. S. Wiśniewski, *Termodynamika techniczna*, PWN Warszawa, 2017.
2. D. Halliday, R. Resnick, J. Walker, *Podstawy fizyki – tom 2*, PWN Warszawa, 2014.
3. S.R. de Groot, P. Mazur, *Non-equilibrium Thermodynamics*, Dover, New York, 1984.
4. P. Atkins, J. de Paula, *Physical Chemistry*, Oxford University Press, Oxford, United Kingdom, 2014.

| |
|---|
| **Additional Literature** |
| 1. A.W. Adamson, A.P. Gast, *Physical Chemistry of Surface,* Wiley-Interscience, New York, 1997.<br>2. J. E. Verwey, J. T. G. Overbeek, *Theory of The Stability of Lyophobic Colloids,* Elsevier, Amsterdam, 1948.<br>3. P. Flory, *Principles of Polymer Chemistry;* Cornell University Press: Ithaca, NY, USA, 1953. |

POLITECHNIKA BYDGOSKA
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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.nch.II |
| Item Name | **A block of subjects from the discipline of *chemical sciences* to choose from:**<br>**HOT TOPICS IN MODERN PHYSICS** |
| Course coordinator responsible for preparing the syllabus | prof. dr hab. Sylwia Zielińska-Raczyńska |

## 1. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15*** | prof. dr hab. Sylwia Zielińska-Raczyńska |

7 meetings, each will discuss different issues related to the most modern achievements in modern physics and computer science, in particular quantum physics. The lectures will be based on publications describing the latest reports from "Nature" (IF=38) and "Science" (IF=41), i.e. scientific journals with the highest impact index in science. The subject matter will concern the most contemporary trends in basic research, constituting the basis for further technological concepts and know-how in the development of civilization.
The basic assumption of such a series of lectures is to track progress, hence the subject matter will be
updated every year.

## 2. TEACHING METHODS

lecture (8 hours) seminars (7 hours)
multimedia lecture and accompanying discussion some issues will be discussed in a conversational form

## 3. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies a) to the extent that allows for the revision of existing paradigms – the world achievement, including theoretical foundations and general issues and selected specific issues specific to the chemical sciences |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies b) the main development trends of the discipline of chemical sciences |
| P8S_WG_c | Context – conditions, effects<br>c) the methodology of scientific research of chemical sciences |
| P8S_WK_c | Context – conditions, effects |

| | |
|---|---|
| | c) basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to these results in the field of chemical sciences |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) use knowledge from various fields of science to creatively identify, formulate and innovatively solve complex problems or perform research tasks in the field of chemical sciences |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Evaluations – a critical approach<br>a) critical evaluation of achievements in the field of chemical sciences |

## 4. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | | | X | X |
| P8S_WG_b | | | | | X | X |
| P8S_WG_c | | | | | X | X |
| P8S_WK_c | | | | | X | X |
| P8S_UW_a | | | | | X | X |
| P8S_KK_a | | | | | X | X |

## 5. LITERATURE

**Basic Literature**

1. J.C. Garrison, R.Y. Chiao, *Quantum optics,* Oxford University Press, Oxford, New York 2012
2. Ian Stewart, *17 równań, które zmieniły świat*, Warszawa 2013
3. Michito Kaku, *Fizyka przyszłości: nauka do 2100 roku*, Warszawa 2021
4. Frank Wilczek, *Lekkość bytu; masa, eter i unifikacja sił,* Warszawa 2011
5. Kenneth W. Ford, *101 kwantowych pytań; wszystko co chcielibyście wiedzieć o świecie, którego nie widać,* Warszawa 2021
6. Pozostałe pozycje literaturowe będą podawana na bieżąco, w trakcie zajęć.

**Additional Literature**

1. Frank Close, *Zagadka nieskończoności*, Warszawa 2013
2. Lee Smolin, *Kłopoty z fizyką*, Warszawa 2008
3. Ian Stewart, *Czy Bóg gra w kości? Nowa matematyka chosu,* Warszawa 1994

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.nch. III |
| Item Name | **A block of subjects from the discipline of *chemical sciences* to choose from:**<br>**POLYMER NANOCOMPOSITES** |
| Course coordinator responsible for preparing the syllabus | dr inż. Katarzyna Skórczewska, prof. PBŚ<br>dr inż. Krzysztof Lewandowski |

## 1. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15*** | dr inż. Katarzyna Skórczewska, prof. PBŚ<br>dr inż. Krzysztof Lewandowski |

*- subject taught separately in a group of disciplines

The concept of nanotechnology, polymer nanocomposites and directions of their development.
Overview of nanoadditives used.
Properties of polymer nanocomposites – methods of assessing their properties and structure
Modern methods of producing polymer nanocomposites – research and practical aspect.
Physical and chemical modifications of nanofillers.
Problems in the production of polymer nanocomposites
Contemporary and future directions of application of polymer nanocomposites.
Opportunities and threats in the production and application of nanoadditives and polymer nanocomposites.
Design and implementation of a research program in terms of solving research and practical problems related to polymer nanocomposites.

## 2. TEACHING METHODS

Lecture – 15 hours
Multimedia lecture, discussion.

## 3. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies a) to the extent that allows for the revision of existing paradigms – the world achievement, including theoretical foundations and general issues and selected specific issues specific to the chemical sciences |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies b) the main development trends of the discipline of chemical sciences |
| P8S_WG_c | Context – conditions, effects<br>c) the methodology of scientific research of chemical sciences |

| | |
|---|---|
| P8S_WK_c | Context – conditions, effects<br>c) basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to these results in the field of chemical sciences |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) use knowledge from various fields of science to creatively identify, formulate and innovatively solve complex problems or perform research tasks in the field of chemical sciences |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Evaluations – a critical approach<br>a) critical evaluation of achievements in the field of chemical sciences |

## 4. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | x | | x | |
| P8S_WG_b | | | x | | x | |
| P8S_WG_c | | | x | | x | |
| P8S_WK_c | | | x | | x | |
| P8S_UW_a | | | x | | x | |
| P8S_KK_a | | | x | | x | |

## 5. LITERATURE

**Basic Literature**

1. Praca zbiorowa pod redakcją A. Świderskiej -Środy: Świat nanocząstek. PWN Warszawa 2016r.
2. K. Kurzydłowski, M. Lewandowska: Nanomateriały inżynierskie konstrukcyjne i funkcjonalne. PWN Warszawa 2010r.
3. R. Falcon: Handbook of Nanomaterials. Research Press New York 2015

**Additional Literature**

1. Baza Scopus: https://www.scopus.com/
2. Joseph H. Koo: Polymer nanocomposites Processing, Characterization and Application. The McGraw-Hill Companies 2016 ISBN 978-07-149204-1
3. Praca zbiorowa pod redakcją Vijay Kumar Thakur: Eco-Friendly Polymer Nanocomposites Processing and Properties. Springer 2016 ISBN 978-81-322-2470-9
4. Praca zbiorowa pod redakcją K. Zelechowskiej: Nanotechnologia w praktyce. PWN Warszawa 2016r.

5. Vikas Mittal: Modeling and Prediction of Polymer Nanocomposite Properties. Wiley-VCH 2013

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.nch.IV |
| Item Name | **A block of subjects from the discipline of *chemical sciences* to choose from:**<br>**MODERN TECHNIQUES OF QUALITATIVE AND QUANTITATIVE ANALYSIS IN GAS CHROMATOGRAPHY** |
| Course coordinator responsible for preparing the syllabus | dr inż. Łukasz Dąbrowski |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **30*** | dr inż. Łukasz Dąbrowski |

*- subject taught separately in a group of disciplines

**Lectures**:
qualitative and quantitative analysis in gas chromatography: introduction and basic concepts, retention parameters in gas chromatography (retention time, relative retention time, retention index – RI et al.) and their application in qualitative analysis; use of specific detectors and multi-detector systems to confirm the results of the analysis; the use of a mass spectrometer as a detector allowing for the separation of co-eluting substances (methods of deconvolution of mass spectra); Quantitative analysis using different calibration methods

**Laboratory exercises:**
modern software for data acquisition and chromatogram processing for qualitative and quantitative analysis, use of available databases to determine the initial conditions for conducting chromatographic analysis and helpful in qualitative analysis (RI, MS); practical aspects of the application of software for deconvolution of mass spectra; chromatographic analysis of selected mixtures of compounds in order to obtain data that can be processed using previously known software and databases.

## 3. TEACHING METHODS

Lectures - 15 hours, laboratory classes - 15 hours.

Lectures (15 hours) - colloquium / laboratory classes (15 hours) - reports

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |

| | |
|---|---|
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies a) to the extent that it is possible to revise the existing paradigms – the world body of work on gas chromatography, including theoretical foundations and general issues and selected specific issues (qualitative and quantitative analysis). |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies b) main trends in the development of the discipline of chemical sciences in the field of gas chromatography |
| P8S_WG_c | Context – conditions, effects<br>c) methodology of chromatographic studies using gas chromatography |
| P8S_WK_c | Context – conditions, effects<br>c) basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to these results in the field of gas chromatography |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) use knowledge from various fields of science to creatively identify, formulate and innovatively solve complex chromatographic problems (such as selectivity, sensitivity) or perform research tasks in the field of gas chromatography |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Evaluations – a critical approach<br>a) critical evaluation of achievements in the discipline of chemical sciences |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Report | Academic Essay |
| P8S_WG_a | | | x | | x | |
| P8S_WG_b | | | x | | x | |
| P8S_WG_c | | | x | | x | |
| P8S_WK_c | | | x | | x | |
| P8S_UW_a | | | x | | x | |
| P8S_KK_a | | | x | | x | |

## 6. LITERATURE

**Basic Literature**

1. Z. Witkiewicz, J. Kałużna-Czaplińska, Podstawy chromatografii i technik elektromigracyjnych, PWN, Warszawa 2017
2. Z. Witkiewicz, W. Wardencki, Chromatografia gazowa - teoria i praktyka, WN PWN Warszawa 2018
3. Chromacademy (www.chromacadey.com)

| Additional Literature |
| --- |
| 1. P. Konieczka, J. Namieśnik (red). Ocena i kontrola jakości wyników pomiarów analitycznych, WNT, Warszawa 2014<br>2. H-J. Hubschmann, Handbook of GC/MS : fundamentals and applications, Wiley-VCH, Weinheim 2001 |

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HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.nch.V |
| Item Name | **Block of subjects from the discipline of *chemical sciences choose from:*<br>MODERN TECHNIQUES COMBINED IN ANALYTICAL CHEMISTRY** |
| Course coordinator responsible for preparing the syllabus | dr hab. Przemysław Kosobucki, prof. PBŚ |

## 1. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15*** | dr hab. Przemysław Kosobucki, prof. PBŚ |

*- subject taught separately in a group of disciplines

A brief historical outline of separation methods (chromatography, electromigration techniques), criteria for the selection of methods. Mechanisms and theory of chromatographic separation, discussion of stationary phases, retention parameters, separation factor, selectivity and resolution. Optimizing chromatographic separation: van Deemter equation, column efficiency. Construction of a gas chromatograph, including: discussion of injection devices (dispensers), chromatographic columns, detectors. Coupling of gas chromatography with mass spectrometry. Basic mass analyzers in GC MS and GC MS/MS systems. Dispensers, analytical and preparative columns, spectrophotometric, electrochemical and other specific detectors. Coupling of HPLC technique with mass spectrometry. ESI, TSI and other interfaces. Analyzers Chip LC MS. Sample injection methods in mass spectrometry, types of ionization (EI, CI, APCI, ESI, MALDI). Tandem and multiple mass spectrometry Multivariate and multivariate chromatography combined with mass spectrometry (GCxGC-ToFMS, LCxLC-MS). Other conjugated techniques (IC-MS). Mechanisms and theory of separation in electromigration techniques. Coupled electromigration techniques (CZE-MS, ITP-MS). Chip systems.

## 2. TEACHING METHODS

Lecture - 15 hours
Lecture (15 hours) with multimedia presentation, discussion.

## 3. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | The student has in-depth knowledge of separation methods, enabling them to conduct advanced research work |

| | |
|---|---|
| | related to the analysis of industrial and environmental samples. He knows the basics, as well as the structure and operation of a mass spectrometer. |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies b) The student knows the directions of development of analytics and knows the principles of green analytical chemistry. |
| P8S_WG_c | The student has in-depth knowledge of the preparation of environmental and industrial samples for analysis and instrumental techniques of chromatographic and electromigration techniques coupled with a mass spectrometer, among others. |
| P8S_WK_c | The student knows and understands the essence of intellectual property protection, types of industrial property objects and the essence of copyright law, as well as selected institutions and organizations in the field of intellectual property protection in Poland, the EU and in the world |
| SKILLS: can | |
| P8S_UW_a | is able to select the technique of sample preparation and then the appropriate technique coupled for analysis, depending on their chemical nature and the matrix in which they occur |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | is aware of the need to constantly monitor legal regulations related to environmental protection |

## 4. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | x | | | | |
| P8S_WG_b | | x | | | | |
| P8S_WG_c | | x | | | | |
| P8S_WK_c | | x | | | | |
| P8S_UW_a | | x | | | | |
| P8S_KK_a | | x | | | | |

## 5. LITERATURE

**Basic Literature**

1. W. Szczepaniak, "Metody instrumentalne w analizie chemicznej", Wydawnictwo naukowe PWN, Warszawa, 2012.
2. D.A. Skoog, D.M. West, F.J. Holler, S.R. Crouch, "Podstawy chemii analitycznej 2", Wydawnictwo Naukowe PWN, Warszawa 2007
3. J. Kałużna-Czaplińska, Z. Witkiewicz, Podstawy chromatografii i technik elektromigracyjnych, PWN, Warszawa 2017.
4. R. Johnstone, M. Rose, "Spektrometria mas", PWN, Warszawa 2001.
5. P. Suder, J. Silberring, „Spektrometria mas", Wydawnictwo UJ, Kraków 2006.
6. A. Kraj, A. Drabik, J. Silberring, "Proteomika i metabolomika", Wydawnictwo UW, Warszawa 2010.

7. A. Hulanicki, „Współczesna chemia analityczna. Wybrane zagadnienia”, PWN, Warszawa 2001.
8. B. Buszewski, E. Dziubakiewicz, M. Szumski, „Techniki elektromigracyjne. Teoria i praktyka”, Malamut, Warszawa, 2012.

**Additional Literature**

1. Z. Witkiewicz, J. Hepter, „Chromatografia gazowa”, Wydawnictwo NT, Warszawa, 2009.
2. C.F. Poole, „The essence of chromatography”, Elsevier, Amsterdam, 2003.
3. A. Cygański, „Metody spektroskopowe w chemii analitycznej”, Wydawnictwo WNT, Warszawa, 2012.

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HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.nch.VI |
| Item Name | **A block of subjects from the discipline of *chemical sciences* to choose from:**<br>**MODERN TRENDS IN THE ENERGY SECTOR – GREEN ENERGY** |
| Course coordinator responsible for preparing the syllabus | dr inż. Sylwia Kwiatkowska-Marks |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15*** | dr inż. Sylwia Kwiatkowska-Marks |
| Energy sources. Renewable and non-renewable energy resources. Renewable Energy Sources in Poland and in the world. Green and blue hydrogen. Fuel cells. Geothermal energy. The energy of the sun. Photovoltaics. Aerothermal energy. Hydrothermal. The energy of sea currents, tides and waves. Biomass energy. Alternative energy sources. Energy management. | | |

## 3. TEACHING METHODS

| |
|---|
| Multimedia lecture - 15 hours.<br>Multimedia lecture. Synchronous distance learning. |

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies a) to the extent that allows for the revision of existing paradigms – the global achievement, including theoretical foundations and general issues and selected specific issues relevant to chemical and related sciences |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies b) main development trends in the energy sector of renewable energy sources |
| P8S_WG_c | Scope and depth – completeness of cognitive perspective and dependencies b) methodology of scientific research in the field of renewable energy sources |
| P8S_WK_c | Context – conditions, effects |

| | |
|---|---|
| | (c) the basic principles of knowledge transfer to the economic and social sphere and the commercialisation of the results of scientific activities and the know-how related to these results in the field of renewable energy; |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) use knowledge from various fields of science to creatively identify, formulate and innovatively solve complex problems or perform research tasks in the field of modern trends in the energy sector |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Evaluations – a critical approach<br>a) critical evaluation of achievements in the field of chemical and related sciences |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | x | | | |
| P8S_WG_b | | | x | | | |
| P8S_WG_c | | | x | | x | |
| P8S_WK_c | | | x | | | |
| P8S_UW_a | | | x | | x | |
| P8S_KK_a | | | | | x | |

## 6. LITERATURE

**Basic Literature**

1. Jastrzębska G., Energia ze źródeł odnawialnych i jej wykorzystanie, Wydawnictwa Komunikacji i Łączności, Warszawa 2017
2. Klugmann-Radziemska E., Lewandowski W., Proekologiczne odnawialne źródła energii. Kompendium, Wydawnictwo Naukowe PWN, Warszawa 2017
3. Niedziółka D., Zielona energia w Polsce, CeDeWu, Warszawa 2012
4. Wolańczyk F, *Elektrownie wiatrowe*, KaBe, Krosno, 2009
5. Nowak W., Stachel A., Borsukiewicz-Gozdur A., *Zastosowania odnawialnych źródeł energii*, Wyd. Politechniki Szczecińskiej, Szczecin, 2008

**Additional Literature**

1. *Czasopisma branżowe, np. Polska Energetyka Słoneczna*, 2018

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HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.nch. VII |
| Item Name | **Block of subjects from the discipline of *chemical sciences* choose from:**<br>**PLASTICS TESTING TECHNIQUES** |
| Course coordinator responsible for preparing the syllabus | dr inż. Krzysztof Lewandowski<br>dr inż. Katarzyna Skórczewska, prof. PBŚ |

## 1. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15*** | dr inż. Krzysztof Lewandowski |

*- subject taught separately in a group of disciplines

Influence of chemical structure on selected functional and processing properties of polymer plastics. The concept of polymer plastics. Identification test methods – quantitative and qualitative analysis of polymers. Principles for the determination of mechanical, thermal and processing properties of polymer plastics. Structure assessment. Standardization of tests. Advanced and modern measurement techniques. Design and implementation of a research program in terms of solving practical and scientific problems related to polymer plastics.

## 2. TEACHING METHODS

Lecture – 15 hours
Multimedia lecture, discussion.

## 3. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies a) to the extent that allows for the revision of existing paradigms – the world achievement, including theoretical foundations and general issues and selected specific issues specific to the chemical sciences |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies b) the main development trends of the discipline of chemical sciences |
| P8S_WG_c | Context – conditions, effects<br>c) the methodology of scientific research of chemical sciences |
| P8S_WK_c | Context – conditions, effects<br>c) basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to these results in the field of chemical sciences |
| SKILLS: can | |

| | |
|---|---|
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) use knowledge from various fields of science to creatively identify, formulate and innovatively solve complex problems or perform research tasks in the field of chemical sciences |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Evaluations – a critical approach<br>a) critical evaluation of achievements in the field of chemical sciences |

## 4. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | x | | x | |
| P8S_WG_b | | | x | | x | |
| P8S_WG_c | | | x | | x | |
| P8S_WK_c | | | x | | x | |
| P8S_UW_a | | | x | | x | |
| P8S_KK_a | | | x | | x | |

## 5. LITERATURE

**Basic Literature**

1. Broniewski T., Kapko J., Płaczek W., Thomalla J.: Metody badań i ocena właściwości tworzyw sztucznych, WNT, Warszawa 2000
2. Grellmann W. (red), Seidler S. (red.): Polymer Testing, Hanser Publications; Monachium 2007
3. Brown R. (red.): Handbook of Polymer Testing - Short-Term Mechanical Tests, Rapra Technology Limited, Shawbury 2002
4. European and Polish standards: EN ISO 527, EN ISO 1133, EN ISO 179, EN ISO 306

**Additional Literature**

1. Karasiewicz T., Moraczewski K., Rytlewski P., Stepczyńska M., Żenkiewicz M.: Metody badań i oceny niektórych właściwości tworzyw polimerowych i metali, Wydawnictwo UKW, Bydgoszcz 2012
2. Przygocki W.: Metody fizyczne badań polimerów, PWN, Warszawa 1990
3. scopus.com

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HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.nch. VIII |
| Item Name | **A block of subjects from the discipline of *chemical sciences* to choose from:**<br>**MODERN EXPERIMENTAL TECHNIQUES** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Łukasz Skowroński, prof. PBŚ |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15*** | dr hab. inż. Łukasz Skowroński, prof. PBŚ |

*- subject taught separately in a group of disciplines

Lecture:
The lecture presents modern experimental techniques in the study of materials and elements of the theory of physical phenomena used in them.
1. General characteristics of materials
2. Elements of solid state physics
3. Surface Topography Survey (AFM, SEM, STM, TEM, COM)
4. X-rays – structural studies of materials
5. Electron spectroscopy (XPS/UPS, AES)
6. IR spectroscopy, Raman scattering
7. Spectrophotometry, Ellipsometric Spectroscopy

Seminar:
During the seminar, PhD students present the issue of the application of a selected measurement technique in materials research.

## 3. TEACHING METHODS

Lecture - 10 hours, seminar - 5 hours.

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies a) to the extent that allows for the revision of existing paradigms – the world achievement, including theoretical foundations and general issues and selected specific issues specific to the chemical sciences |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies b) the main development trends of the discipline of chemical sciences |
| P8S_WG_c | Context – conditions, effects |

| | |
|---|---|
| | c) the methodology of scientific research of chemical sciences |
| P8S_WK_c | Context – conditions, effects<br>c) basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to these results in the field of chemical sciences |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) use knowledge from various fields of science to creatively identify, formulate and innovatively solve complex problems or perform research tasks and draw conclusions based on the results of scientific research in the field of chemical sciences |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Evaluations – a critical approach<br>a) critical evaluation of achievements in the field of chemical sciences |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | | x | x | |
| P8S_WG_b | | | | x | x | |
| P8S_WG_c | | | | x | x | |
| P8S_UW_a | | | | x | x | |
| P8S_KK_a | | | | x | x | |

## 6. LITERATURE

**Basic Literature**

1. R.W. Kelsall, I.W. Hamley, M. Geoghegan: Nanotechnologie, Wydawnictwo Naukowe PWN, 2008.
2. W.Szczepaniak, Metody instrumentalne w analizie chemicznej, Wydawnictwo Naukowe PWN, 2007
3. C. Kittel, Wstęp do fizyki ciała stałego, Wydawnictwo Naukowe PWN, 1976.

**Additional Literature**

1. W.Zieliński, A.Rajca, Metody spektroskopowe i ich zastosowanie do identyfikacji związków organicznych, Wojciech Zieliński (red.), Andrzej Rajca (red.), Roman Mazurkiewicz, Warszawa: WNT, 2000
2. A.Zawadzka, Cienkie warstwy i nanostruktury cienkowarstwowe – eksperymentalne metody wytwarzania i badania właściwości, Wydawnictwo Naukowe UMK, Toruń 2016

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.nch. IX |
| Item Name | **A block of subjects from the discipline of *chemical sciences* to choose from:**<br>**THIN-FILM SYSTEMS – PREPARATION AND PROPERTIES** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Łukasz Skowroński, prof. PBŚ |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15*** | dr hab. inż. Łukasz Skowroński, prof. PBŚ |

*- subject taught separately in a group of disciplines

Lecture:
1. Thin-film systems – preliminary issues
2. Thin film growth models
3. Obtaining thin films (PVD and CVD)
4. Microstructure of thin-film systems
5. Mechanical Properties
6. Optical Properties
7. Catalytic properties
8. Sensory properties

Seminar:
During the seminar, PhD students present the issue of properties of selected materials.

## 3. TEACHING METHODS

Lecture - 10 hours, seminar - 5 hours.

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies a) to the extent that allows for the revision of existing paradigms – the world achievement, including theoretical foundations and general issues and selected specific issues specific to the chemical sciences |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies b) the main development trends of the discipline of chemical sciences |
| P8S_WG_c | Context – conditions, effects<br>c) the methodology of scientific research of chemical sciences |
| P8S_WK_c | Context – conditions, effects |

| | |
|---|---|
| | c) basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to these results in the field of chemical sciences |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) use knowledge from various fields of science to creatively identify, formulate and innovatively solve complex problems or perform research tasks and draw conclusions on the basis of the results of research in the field of chemical sciences |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Evaluations – a critical approach<br>a) critical evaluation of achievements in the field of chemical sciences |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | | x | x | |
| P8S_WG_b | | | | x | x | |
| P8S_WG_c | | | | x | x | |
| P8S_WK_a | | | | x | x | |
| P8S_UW_a | | | | x | x | |
| P8S_KK_a | | | | x | x | |

## 6. LITERATURE

| **Basic Literature** |
|---|
| 1. R.W. Kelsall, I.W. Hamley, M. Geoghegan: Nanotechnologie, Wydawnictwo Naukowe PWN, 2008.<br>2. A.Zawadzka, Cienkie warstwy i nanostruktury cienkowarstwowe – eksperymentalne metody wytwarzania i badania właściwości, Wydawnictwo Naukowe UMK, Toruń 2016 |
| **Additional Literature** |
| 1. K. Kurzydłowski, M. Lewandowska, Nanomateriały inżynierskie konstrukcyjne i funkcjonalne, Wydawnictwo Naukowe PWN, Warszawa 2021 |

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HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.nozij.I |
| Item Name | **A block of subjects from the discipline of *management and quality studies* to choose from: SUSTAINABLE BUSINESS MANAGEMENT** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Małgorzata Gotowska prof. PBŚ. |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| | **15h** | dr hab. inż. Małgorzata Gotowska prof. PBŚ |
| Lecture 1: Business management in a turbulent environment.<br>Lecture 2: The life cycle of an organization and the concept of sustainable development.<br>Lectures 3 and 4: Implementing sustainable development in the processes of organizational functioning.<br>Lecture 5 and 6: Turquoise organization management in the aspect of sustainable development.<br>Lectures 7 and 8: Sustainable development and corporate social responsibility.<br>Lecture 9: Sustainable development of the company as an element of employer branding.<br>Lecture 10: Creating green competences of employees in a sustainable organization.<br>Lecture 11 and 12: Work-life-balance as a modern concept of employee management.<br>Lecture 13: Sustainable innovation in the organization.<br>Lectures 14 and 15: Building and maintaining a sustainable organization in a rapidly changing environment. | | |

## 3. TEACHING METHODS

| |
|---|
| multimedia lecture, demonstration, discussion, lecture, case method<br>lecture (15 hours) |

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Knows and understands to the extent that allows for the revision of existing paradigms – the world's achievements, including theoretical foundations as well as general issues and selected specific issues – appropriate for disciplines of management and quality sciences. |

| | |
|---|---|
| P8S_WG_b | Knows and understands the main development trends in the discipline of management and quality science. |
| P8S_WG_c | Knows and understands the methodology of scientific research specific to the science of management and quality. |
| P8S_WK_c | He knows and understands the basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity in the field of management and quality science. |
| SKILLS: can | |
| P8S_UW_a | He/she is able to use knowledge from various fields of science to creatively identify, formulate and innovatively solve complex problems or perform research tasks, and creatively apply and draw conclusions based on the results of scientific research. |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | He is ready to critically evaluate the achievements within the discipline of management and quality science. He is ready to think in an entrepreneurial way. |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | x | | | | | |
| P8S_WG_b | | | | | x | |
| P8S_WG_c | | | | | x | |
| P8S_WK_c | | | | | x | |
| P8S_UW_a | | | | | x | |
| P8S_KK_a | | | | | x | |

## 6. LITERATURE

| **Basic Literature** |
|---|
| 1. Agnieszka Rzeńca, Dominik Drzazga, Małgorzata Burchard-Dziubińska, Zrównoważony rozwój - naturalny wybór. 2014, Wyd. Uniwersytetu Łódzkiego.<br>2. Wyzwania Zrównoważonego Rozwoju w Polsce (pr. zb., red. J. Kroneberg i T. Bergier). Wyd. Fundacja Sendzimira, Kraków 2010.<br>3. Piotr Trzepacz „Zrównoważony rozwój - wyzwania globalne" (2012); Podręcznik dla uczestników studiów doktoranckich, IGiGP UJ, Kraków - wybrane fragmenty. |
| **Additional Literature** |
| 1. Kronenberg Jakub, Bergier Tomasz (red.) - Wyzwania zrównoważonego rozwoju w Polsce. Fundacja Sendzimira, 2010 |

2. Wskaźniki zrównoważonego rozwoju. Borys T. (red.) . Wyd. Ekonomia i Środowisko, 2005,ss. 348

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HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.nozij.II |
| Item Name | **A block of subjects from the discipline of *management and quality studies* to choose from:**<br>**MODERN TYPES OF LEADERSHIP** |
| Course coordinator responsible for preparing the syllabus | dr hab. Iwona Posadzińska, prof. PBŚ |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15** | dr hab. Iwona Posadzińska, prof. PBŚ |
| Leadership – origins, concepts, basic issues. Classic and modern models of leadership. Concepts and types of leadership. Qualities and tasks of a leader. Leader's personality. Situational models of leadership. Methods of personal development of a leader. Directions of changes in leadership styles in international business in the 21st century. | | |

## 3. TEACHING METHODS

| |
|---|
| Multimedia lecture, discussion |

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Knows in-depth knowledge of the evolution of views on leadership and the change of paradigms of management sciences and quality in the field of leadership |
| P8S_WG_b | Knows the main development trends in the discipline of management and quality sciences |
| P8S_WG_c | Knows the methodology for identifying targeting styles |
| P8S_WK_c | He knows the basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity in the field of management and quality science. |
| SKILLS: can | |
| P8S_UW_a | Can use knowledge from various disciplines of social sciences to creatively solve managerial problems. |

| SOCIAL COMPETENCE: is ready to | |
|---|---|
| P8S_KK_a | They are prepared to critically evaluate their achievements within the discipline of management and quality sciences. |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | X | | | | | |
| P8S_WG_a | | | | | X | |
| P8S_WG_c | X | | | | | |
| P8S_WK_c | | | | | X | |
| P8S_UW_a | X | | | | | |
| P8S_KK_a | X | | | | | |

## 6. LITERATURE

| **Basic Literature** |
|---|
| 1. Karaszewski R., Skrzypczyńska K., Przywództwo w biznesie, TNOiK, Toruń 2016<br>2. Blanchard K., Przywództwo wyższego stopnia. Blanchard o przywództwie i tworzeniu efektywnych organizacji, PWN, Warszawa 2021<br>3. Karaszewski R., Drewniak R., Skrzypczyńska K., Ewolucja stylów przywództwa, TNOiK, Toruń 2019 |
| **Additional Literature** |
| 1. Belker Loren B., Jim McCormick, Topchik Gary S., Początkujący menedżer, PWN, Warszawa 2023<br>2. Karaszewski R., Przywództwo w środowisku globalnego biznesu, TNOiK, Toruń 2008<br>3. Grint K., The Arts of Leadership, Oxford 2001 |

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HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.nozij.III |
| Item Name | **A block of subjects from the discipline of *management and quality studies* to choose from: RESOURCE-PROCESS COST ACCOUNTING** |
| Course coordinator responsible for preparing the syllabus | dr hab. Arkadiusz Januszewski, prof. PBŚ |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15W+15Design** | dr hab. Arkadiusz Januszewski, prof. PBŚ |

**Lecture**:
Imperfections of traditional cost accounting. Premises for the creation and implementation of activity cost accounting. The essence of *Activity Based Costing (ABC)* and *Resource Cost Accounting (RCA).* Interpretation of the cumulative profit chart (the so-called whale curve). Characteristics of resources, activities and cost objects. Simple and complex RCA/ABC models. Cost flow network in ABC. Resource cost objects and activity cost objects. Evaluate the profitability of products, customers, and suppliers in the ABC of activity costs.
Methodologies for the design and implementation of resource and process cost accounting. Construction phases of the RCA/ABC system. RCA/ABC model structures. Define processes, activities, and cost objects. Defining the resource structure of your company and assigning costs to resources. Define flow paths. Principles of designing a contribution margin account using the OPC.
**Project:**
Independent development of a model of resource and process accounting of cost accounting for a selected company. Implementation of the developed model in the IT environment. Presentation and interpretation of results.

## 3. TEACHING METHODS

Multimedia lecture, case studies
Spreadsheet design method

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Understands the essence of profitability assessment using coverage margin accounts and resource-process cost accounting. Knows the stages and principles of designing a resource-process cost accounting system |
| P8S_WG_b | Knows and understands the main development trends in the discipline of management and quality science. |

| | |
|---|---|
| P8S_WG_c | Knows the methodology of scientific research specific to the science of management and quality. |
| P8S_WK_c | He knows the basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity in the field of management and quality science. |
| SKILLS: can | |
| P8S_UW_a | Can design a resource and process cost accounting system for a micro, small or medium-sized enterprise |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | He is ready to cooperate in the design of a resource and process cost accounting system. Can identify and resolve decision-making problems using their knowledge and acquired skills. |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | x | | | | |
| P8S_WG_b | | | | | x | |
| P8S_WG_c | | | | | x | |
| P8S_WK_c | | | | | x | |
| P8S_UW_a | | | | x | | |
| P8S_KK_a | | | | | x | |

## 6. LITERATURE

**Basic Literature**

1. Zieliński T. Zasobowo-procesowy rachunek kosztów (ZPRK/RPCA). Akademia Controllingu. Poznań, 2017
2. Miller J. Zarządzanie kosztami działań. Wig-Press. Warszawa 2000
3. Piechota R. Projektowanie rachunku kosztów działań. Difin 2005

**Additional Literature**

1. Kaplan R.S, Anderson S.R. Rachunek kosztów działań sterowany czasem. Wydawnictwo Naukowe PWN, Warszawa 2008
2. Cokins, G. Activity-Based Cost Management. An Executive's Guide. John Wiley & Sons, Inc., New York, 2001
3. Miesięcznik Controlling i Rachunkowość Zarządcza – artykuły o rachunku kosztów działań.

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HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.nozij.IV |
| Item Name | **A block of subjects from the discipline of *management and quality studies* to choose from:**<br>**BUSINESS ETHICS** |
| Course coordinator responsible for preparing the syllabus | dr hab. Grażyna Voss prof. PBŚ |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15** | dr hab. Grażyna Voss prof. PBŚ |

1) Business ethics as an element of the functioning of business units.
2) Building relationships between the company and its customers, business partners, employees and competitors.
3) Business ethics and economic analysis.
4) Codes of professional ethics and responsibility for actions taken.
5) Factors that determine the ethics of the company (external and internal).
6) Ethical decision-making and the company's mission, its policy, organizational culture, and employee morality.
7) Core values of business ethics.
8) Non-financial reporting and goodwill.
9) Unethical behaviour – causes and effects.
10) Profit and ethics in business.

## 3. TEACHING METHODS

Lecture, discussion, case study,

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | He knows and understands the world's achievements, including the theoretical foundations of business ethics. Knows and understands the ethical determinants of business and the determinants of business activity and the essence of scientific research |
| P8S_WG_b | Knows and understands the main development trends in the discipline of management and quality science. |
| P8S_WG_c | Knows the methodology of scientific research specific to the science of management and quality. |

| | |
|---|---|
| P8S_WK_c | He knows the basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity in the field of management and quality science. |
| SKILLS: can | |
| P8S_UW_a | Is able to critically analyze and evaluate the results of scientific research in the context of ethical behavior in business. |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | It conducts scientific and research activities in an independent manner and in accordance with business ethics. He is ready to critically evaluate his achievements within the framework of business ethics. |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | | | x | |
| P8S_WG_b | | | | | x | |
| P8S_WG_c | | | | | x | |
| P8S_WK_c | | | | | x | |
| P8S_UW_a | | | | | | x |
| P8S_KK_a | | | | | x | x |

## 6. LITERATURE

| **Basic Literature** |
|---|
| 1. Etyka biznesu, Peale Norman Vincent Blanchard Kenneth, Studio EMKA,<br>2. Etyka biznesu i społeczna odpowiedzialność biznesu - Arasu R, KS OmniScriptum Publishing |
| **Additional Literature** |
| 1. Codes of Professional Ethics (in Accounting, for Auditors) |

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HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.nozij.V |
| Item Name | **A block of courses from the discipline of *management and quality studies* to choose from:**<br>**BUSINESS RELATIONSHIP MANAGEMENT** |
| Course coordinator responsible for preparing the syllabus | dr Urszula Słupska |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15** | dr Urszula Słupska |

Lecture:
1. The essence and components of relational capital
2. Relational Capital Measurement and Relationship Management
3. Building intra-organizational relationships
4. Building relationships with the environment
5. Network relationships in business
6. Virtual relationships in business

Case studies:
During the classes, doctoral students present aspects of building relationships in the organization of their choice.

## 3. TEACHING METHODS

Multimedia and informational lecture conducted by the method of explaining issues and discussion. Case studies in the field of issues presented during the lecture.

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies<br>a) The doctoral student knows the theoretical foundations and selected specific aspects specific to the science of management and quality; In particular, he knows and understands the essence and importance of relationship management in business. |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies<br>b) The PhD student knows and understands the main development tendencies in the discipline of management and quality science, in particular regarding relationship building in the modern business world. |
| P8S_WG_c | Scope and depth – completeness of cognitive perspective and dependencies<br>c) The doctoral student is familiar with the research methodology specific to management and quality science, used to study relational capital. |

| | |
|---|---|
| P8S_WK_c | Context – conditions, effects<br>c) A PhD student understands the role of relational capital in building a competitive advantage. He knows the basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity in the field of management and quality science. |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) A PhD student is able to use the acquired knowledge to creatively identify and solve problems related to relationship management in organizations. |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Evaluations – a critical approach<br>a) A doctoral student is ready to critically evaluate the achievements within the framework of management and quality science, in particular aspects of building business relationships. Can analyze different approaches to relationship management in business and choose the right ones. |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | | x | x | |
| P8S_WG_b | | | | x | x | |
| P8S_WG_c | | | | x | x | |
| P8S_WK_c | | | | x | x | |
| P8S_UW_a | | | | x | x | |
| P8S_KK_a | | | | x | x | |

## 6. LITERATURE

**Basic Literature**

1. Karaszewski R., Posadzińska I., Drewniak R., Drewniak Z., Słupska U. (2020), *Kapitał relacyjny w biznesie*, Wydawnictwa Uczelniane UTP, Bydgoszcz.
2. Chomiak-Orsa I. (2016), *Zarządzanie relacjami w organizacjach sieciowych*, „Zeszyty Naukowe Politechniki Śląskiej; Organizacja i Zarządzanie", z.90, nr 1953.

**Additional Literature**

1. Danielak W. (2012), *Kształtowanie kapitału relacyjnego w małym i średnim przedsiębiorstwie*, Wydawnictwo Uniwersytetu Ekonomicznego, Wrocław.
2. Zakrzewska-Bielawska A. (2016), *Potencjał relacyjny a innowacyjność przedsiębiorstwa – w kierunku open innovation,* „Management Forum", Vol. 4(1), s. 3-10.
3. García-Merino J.D., García-Zambrano L., Rodriguez-Castellanos A. (2014), *Impact of Relational Capital on Business Value*, "Journal of Information & Knowledge Management", Vol. 13(1).

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.nozij.VI |
| Item Name | **A block of subjects from the discipline of *management and quality studies* to choose from:**<br>**SOCIAL, ECONOMIC AND ERGONOMIC ASPECTS OF HUMAN RESOURCES MANAGEMENT** |
| Course coordinator responsible for preparing the syllabus | dr inż. Agnieszka Goździewska-Nowicka |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15** | dr inż. Agnieszka Goździewska-Nowicka |

1. Professional development and the concept of WLB (meaning and forms of professional development. Effectiveness and costs of professional development. Professional development of managers and leaders. Self-management.
2. Challenges and strategies of human resources management (challenges related to globalization and European integration. Strategic HRM).
3. Preparation of professional and competency models of managers.
4. Introduction to the issues of stress and burnout (work and career as a source of stress, job satisfaction, organizational and non-organizational stressors, stress in managerial positions).
5. Ergonomics as a modern comprehensive and empirical science (origin and name of ergonomics, definition, subject and scope of ergonomics).
6. A new paradigm in ergonomics (zones of influence of ergonomics, subject of ergonomic research).
7. Optimisation of the working space (optimisation ranges; optimal working position; principles of ergonomics of the hand working space; optimisation of the visual space; optimisation of the height of the working surface in sitting and standing positions; working rooms, lighting and ventilation conditions, dangerous, harmful and burdensome factors).

## 3. TEACHING METHODS

| |
|---|
| Lecture – 15 hours;<br>Multimedia presentation combined with discussion, training videos, business game |

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |

| | |
|---|---|
| P8S_WG_a | to the extent that allows for the revision of existing paradigms – the world achievement, including theoretical foundations and general issues and selected specific issues – specific to a given scientific or artistic discipline |
| P8S_WG_b | main development trends in the scientific or artistic disciplines in which education takes place |
| P8S_WG_c | research methodology |
| P8S_WK_c | basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to these results |
| SKILLS: can | |
| P8S_UW_a | use knowledge from various fields of science or the field of art to creatively identify, formulate and innovatively solve complex problems or perform research tasks, and in particular: define the purpose and object of scientific research, formulate a research hypothesis, develop research methods, techniques and tools and creatively apply them, draw conclusions based on the results of scientific research |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | critical evaluation of achievements within a given scientific or artistic discipline |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | X | | | |
| P8S_WG_b | | | X | | | |
| P8S_WG_c | | | X | | | |
| P8S_WK_c | | | X | | | |
| P8S_UW_a | | | | | X | |
| P8S_KK_a | | | | | X | |

## 6. LITERATURE

**Basic Literature**

1. Pujer K., Ekonomiczne i społeczne aspekty nowoczesnego zarządzania przedsiębiorstwem, Exante, Wrocław 2016.
2. Wykowska M.,Ergonomia, Wyd. AGH, Kraków, 2014.
3. Kordecka D., Bezpieczeństwo pracy i ergonomia, Wyd. CIOP, Warszawa, 2007.
4. Olszewski J., Podstawy ergonomii i fizjologii pracy, Wyd. AE w Poznaniu, Poznań, 2018.

**Additional Literature**

1. Bugajska J. [i in.], Ergonomia, Centralny Instytut Ochrony Pracy, Warszawa 2012.
2. Mikulski R., Bezpieczeństwo i ochrona człowieka w środowisku pracy, Centralny Instytut Ochrony Pracy, Warszawa 2019.

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.nozij.VII |
| Item Name | **A block of courses from the discipline of *management and quality studies* to choose from:**<br>**USE OF MODERN TECHNOLOGIES IN MANAGEMENT PROCESSES** |
| Course coordinator responsible for preparing the syllabus | dr Paweł Modrzyński |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15** | dr Paweł Modrzyński |

The aim of the course is to familiarize doctoral school students with the latest trends and technologies used in the field of management. The course aims to develop the ability to analyze, evaluate and apply modern technologies in various areas of management, including strategic management, operational management, human resource management and innovation management.
Program contents:

1. Introduction to modern technologies in management
- Definition and importance of modern technologies in management
- An overview of the latest technology trends in the field of management
- The impact of modern technologies on business processes
2. Information technology in management
- Management support IT systems (ERP, CRM, SCM)
- Using data analytics and big data in decision-making
- Cloud computing and its importance for management
3. Communication technology and team collaboration
- Online communication and collaboration tools
- The use of social media in management
- Virtual teams and their management
4. Mobile technologies and their role in management
- Mobile applications supporting management
- Leveraging mobility in business process management
- Data security and risk management in the context of mobility
5. Internet of Things (IoT) technologies in management
- The use of IoT in the monitoring and optimization of production processes
- Smart buildings and energy management
- Harnessing IoT data to drive business decisions
6. Artificial Intelligence (AI) and Automation Technologies
- Applying AI to Planning and Optimization
- Automate business processes with AI tools
- Ethical and social aspects related to the use of AI in management
7. Blockchain technologies and their importance for governance
- Principles of blockchain technology

- Using blockchain in supply chain management
- Data security and identification in the context of blockchain technology

8. Implementation of modern technologies in the organization

- The process of implementing new technologies in the company
- Change management in the context of the introduction of modern technologies
- Measuring the effectiveness and evaluating the effectiveness of the use of new technologies

## 3. TEACHING METHODS

Multimedia lecture carried out in a stationary form and/or with the use of available tools and platforms for distance learning.

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | He knows in-depth terminology in the field of management and the use of modern technologies in management processes. |
| P8S_WG_b | Knows and understands the main development trends in the discipline of management and quality science. |
| P8S_WG_c | Knows the methodology of scientific research specific to the science of management and quality. |
| P8S_WK_c | He knows the basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to these results. |
| SKILLS: can | |
| P8S_UW_a | Can use management knowledge to creatively identify, formulating and innovative solution of complex managerial problems. |
| | |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | They are ready to critically evaluate their achievements within the discipline of management and quality science |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | X | | | | |
| P8S_WG_b | | | | | X | |
| P8S_WG_c | | | | | X | |
| P8S_WK_c | | X | | | | |
| P8S_UW_a | | X | | | | |
| P8S_KK_a | | X | | | | |

## 6. LITERATURE

| Basic Literature |
| --- |
| 1. Oliver Laasch, Principles of Management: Practicing Ethics, Responsibility, Sustainability, 2nd Edition, SAGE, Washington DC, 2021<br>2. Peter F. Drucker, Management: Tasks, Responsibilities, Practices, Harper Business, New York, Paperback – April 14, 1993<br>3. Fred R. David and Forest R. David IE, Strategic Management: A Competitive Advantage Approach, Concepts and Cases (16th Edition), Pearson Education, 2017 |
| **Additional Literature** |
| 1. Thomas M. Siebel, Digital Transformation: Survive and Thrive in an Era of Mass Extinction, Rosetta Books, New York 2019<br>2. Daniel Drescher, Blockchain Basics: A Non-Technical Introduction in 25 Steps, 1st Edition, Apress, Frankfurt am Main, 2017<br>3. David L. Poole, Alan K. Mackworth, Artificial Intelligence: Foundations of Computational Agents, 2nd Edition, Cambridge University Press, 2017 |

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.rio.I |
| Item Name | **A block of subjects from the discipline of *agriculture and horticulture* to choose from: AGRONOMY** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Robert Lamparski, prof. PBŚ |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **30** | dr hab. inż. Karol Kotwica, prof. PBŚ<br>dr hab. inż. Roman Rolbiecki, prof. PBŚ<br>prof. dr hab. inż. Jacek Żarski<br>prof. dr hab. inż. Dariusz Piesik<br>dr hab. inż. Robert Lamparski, prof. PBŚ<br>dr hab. inż. Grzegorz Lemańczyk, prof. PBŚ<br>prof. dr hab. inż. Anna Wenda-Piesik<br>dr hab. inż. Wojciech Kozera, prof. PBŚ<br>dr hab. inż. Jarosław Pobereżny, prof. PBŚ |

1. "Environmental conditions of crop production in Poland" – including differences and references of national conditions to the conditions of EU countries) – Karol Kotwica, PhD, DSc, Eng., prof. PBŚ – 2 hours
2. "Crop production in the context of climate and energy policy" – including possible agrotechnical practices to reduce GHC emissions in crop production – Karol Kotwica, PhD, DSc, Eng., prof. PBŚ – 2 hours.
3. "Review of modern tillage systems" – including conditions, limitations, environmental and production effects – Karol Kotwica, PhD, DSc, Eng., prof. PBŚ – 2 hours
4. "Rotation as a basic element of good agricultural practice" – including the environmental and production adverse effects of simplifying rotations and agrotechnical ways of reducing them – Karol Kotwica, PhD, DSc, Eng., prof. PBŚ – 2 hours
5. "Environmental, production and economic aspects of biomass use" – including agrotechnical management of post-harvest residues (including straw), biomass of catch crops, natural fertilizers – Karol Kotwica, PhD, DSc, Eng., prof. PBŚ – 2 hours.
6. "Modern crop irrigation systems in agriculture and horticulture" – Roman Rolbiecki, PhD, DSc, Eng., prof. PBŚ – 2 hours
7. "Observed and predicted climate change and its consequences for agriculture" – Prof. Jacek Żarski, PhD, DSc, Eng. – 2 hours
8. "Climate threats to agriculture and mitigation systems" – Prof. Jacek Żarski, PhD, DSc, Eng. – 2 hours
9. "Volatile organic compounds and phytoegdysteroids in the context of the double defense system of plants" – Prof. Dariusz Piesik, PhD, DSc, Eng. – 2 hours
10. "Entomofauna in the ecological system of plant cultivation" – Robert Lamparski, PhD, DSc, Eng., prof. PBŚ – 2 hours
11. "Environmentally friendly plant protection" – Grzegorz Lemańczyk, PhD, DSc, Eng., prof. PBŚ – 2 hours

12. "Fungal threats to humans and animals and methods of mitigating their effects" – Grzegorz Lemańczyk, PhD, DSc, Eng., prof. PBŚ – 2 hours
13. "The problem with weed resistance to herbicides – ways to counteract this phenomenon" – Prof. Anna Wenda-Piesik, PhD, DSc, Eng. – 2 hours
14. "Fertilization and the biological value of cereal grains" – Wojciech Kozera, PhD, DSc, Eng., prof. PBŚ – 2 hours
15. "Commodity science and storage of plant products" – including storage conditions, modern methods of storage of raw materials and food products, quality assessment of goods and products of plant origin, nutritional value and anti-nutritional components in raw materials and food products – Jarosław Poberężny, PhD, DSc, Eng., prof. PBŚ – 2 hours

## 3. TEACHING METHODS

Lectures - 30 hours

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies<br>a) to the extent that allows for the revision of existing paradigms – to an expert degree evaluates the agronomic research achievements related to the discipline of agriculture and horticulture described in the world literature |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies<br>b) the most important directions of agricultural research |
| P8S_WG_c | Context – conditions, effects<br>(c) the methodology of the agronomic research |
| P8S_WK_c | Context – conditions, effects<br>c) the possibility of using the results of scientific research in agricultural production, |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) use all information in the field of agronomy based on the latest scientific achievements in order to solve their own research problems typical of the discipline of agriculture and horticulture |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Evaluations – a critical approach<br>a) substantive analysis of achievements within the discipline of agriculture and horticulture |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | | | x | |
| P8S_WG_b | | | | | x | |

| | | | | | | |
|---|---|---|---|---|---|---|
| P8S_WG_c | | | | | x | |
| P8S_WK_c | | | | | x | |
| P8S_UW_a | | | | | x | |
| P8S_KK_a | | | | | x | |

## 6. LITERATURE

**Basic Literature**


1. Kopiński J., 2018. Assessment of Organizational and Production Changes in Polish Agriculture in the Context of Selected Environmental Impacts. ZN SGGW, tom 18, z. 4, 284–29.
2. Kopiński J., 2015. Agri-environmental effects of changes in agricultural production in Poland. Ecreg Studies, Vol. 8, No. 3, 5-18.
3. Borek R., Faber A., Jarosz Z., 2017. Redukcja emisji gazów cieplarnianych i amoniaku oraz metody adaptacji do zmian klimatu. Studia i Raporty IUNG-PIB, 52(6), 140ss.
4. Wrzaszcz W., Prandecki K., 2020. Rolnictwo a europejski zielony ład. Problems of Agricultural Economics, 4(365), 156-179.
5. Jaskulski D., Jaskulska I., 2016. Współczesne sposoby i systemy uprawy roli w teorii i praktyce rolniczej. CDR Brwinów o. Poznań, 30ss.
6. Kotwica K., Boruta-Breza B., Bauza-Kaszewska J., Kanarek P., Jaskulska I., Jaskulski D. 2021. The Cumulative Effect of Various Tillage Systems and Stubble Management on the Biological and Chemical Properties of Soil in Winter Wheat Monoculture. Agronomy 11, 1726.
7. Rechcigl M., 2018. CRC Handbook of Agricultural Productivity Volume I Plant Productivity. CRC Press
8. Taylor & Francis Croup Boca Raton London New York, 81ss
9. Doroszewska T., Harasim A., Kopiński J., Kuś J., Laskowska D., Matyka M., Skomra U., Smagacz J., 2015. Wybrane problemy produkcji rolniczej z uwzględnieniem aspektu dóbr publicznych. Studia i Raporty IUNG-PIB, 43(17), 156ss.
10. T5 Kotwica K., Boruta-Breza B., Bauza-Kaszewska J., Kanarek P., Jaskulska I., Jaskulski D. 2021. The Cumulative Effect of Various Tillage Systems and Stubble Management on the Biological and Chemical Properties of Soil in Winter Wheat Monoculture. Agronomy 11, 1726.
11. Barbara Breza-Boruta 1, Karol Kotwica 2 and Justyna Bauza-Kaszewska. 2021. Effect of Tillage System and Organic Matter Management Interactions on Soil Chemical Properties and Biological Activity in a Spring Wheat Short-Time Cultivation. Energies 14, 7451.
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13. Rolbiecki R. 2021. Nawadniać czy nie nawadniać, dylematy współczesnego rolnictwa. [W:] Współczesne uwarunkowania i wyzwania gospodarowania wodą w rolniczej przestrzeni produkcyjnej Wielkopolski. 2021. Monografia, Bykowski J. (red.) Wyd. UP Poznań. 59-69.
14. Rolbiecki R. 2021. Ciśnieniowe systemy nawadniające w uprawach polowych. [W:] Współczesne uwarunkowania i wyzwania gospodarowania wodą w rolniczej przestrzeni produkcyjnej Wielkopolski. 2021. Monografia, Bykowski J. (red.) Wyd. UP Poznań. 71-83.
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16. Kuśmierek-Tomaszewska R., Żarski J. 2021. Assessment of meteorological and agricultural droughts occurrence in central Poland in 1961–2020 as an element of the climatic risk to crop production. Agriculture, 11, 855.

17. Kuśmierek-Tomaszewska R., Żarski J. 2021. The Effects of Plant Irrigation in Poland. In: Zeleňáková M., Kubiak-Wójcicka K., Negm A.M. (eds) Management of Water Resources in Poland. Springer Water. Springer, Cham, p. 379-393.
18. Chojnacka A. 2015. Lotne Związki Organiczne (LZO) : źródła emisji i metody ich usuwania. Poznań, Młodzi Naukowcy Jędrzej Nyćkowiak, 32-38.
19. Thiem B., Kikowska B., Maliński M. P., Kruszka D., Napierała M., Florek E. 2017. Ecdysteroids: production in plant in vitro cultures. Phytochem. Rev. 16 (4), 603-622.
20. Lamparski R., Kotwica K., Modnicki D., Balcerek M., Koim-Puchowska B. 2021. The effect of pro-ecological procedures and plant injury on the content of free phenolic acids in winter wheat and on the feeding and development of *Oulema melanopus*. Arthropod-Plant Interactions 15:937–947.
21. Pruszyński S. 2016. Metody ochrony w integrowanej ochronie roślin. Centrum Doradztwa Rolniczego w Brwinowie, Oddział w Poznaniu, 150ss.
22. Lemańczyk G., Łukanowski A., Baturo-Cieśniewska A. 2021. Poszukiwanie źródeł odporności owsa (Avena sativa L.) na nowy patogeniczny i mykotoksynotwórczy gatunek – Fusarium langsethiae. Biuletyn Instytutu Hodowli i Aklimatyzacji Roślin 295: 203–207.
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HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.rio.II |
| Item Name | **A block of subjects from the discipline of *agriculture and horticulture* to choose from: BIOGEOCHEMISTRY** |
| Course coordinator responsible for preparing the syllabus | prof. dr hab. inż. Bożena Dębska |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **30** | prof. dr hab. inż. Bożena Dębska;<br>dr hab. inż Joanna Lemanowicz, prof. PBŚ;<br>dr hab.inż Aneta Siwik-Ziomek, prof. PBŚ;<br>dr hab.inż Barbara Breza-Boruta, prof. PBŚ,<br>dr hab.inż Wojciech Kozera, prof. PBŚ;<br>dr hab.inż Agata Bartkowiak, prof. PBŚ;<br>prof. dr hab. inż. Mirosław Kobierski |

Phosphorus and enzymes involved in the transformation of this element. The relationship between enzymatic activity and soil fertility. Sulphur as the fourth basic fertilizer component in plant cultivation. Sulphur and enzymes involved in the transformation of this element in the soil. Aluminum, a potential poison of the agrosystem – myth or truth? Selected trace elements in the geo- and biosphere (their division, occurrence in soil and plant, interactions with other elements, soil contamination with these elements). Soil degradation processes. Buffer properties of soils and their ecological importance. Clay minerals in environmental protection. Organic matter in soils – sources, transformations, qualitative composition, properties, with particular emphasis on the properties of humic and fulvic acids. Ecological role of humic substances in the environment. Biodiversity of microorganisms in the soil environment and their participation in the metabolism of organic matter.

## 3. TEACHING METHODS

Lecture – 30 hours
Classes are held in the form of a lecture

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies a) assesses the biogeochemical research achievements related to the discipline of agriculture and horticulture described in the world literature to an expert degree |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies |

| | |
|---|---|
| | (b) main trends in soil-plant relationships |
| P8S_WG_c | Context – conditions, effects<br>c) selected aspects of scientific research methodology for the discipline of agriculture and horticulture |
| P8S_WK_c | Context – conditions, effects<br>c) basic principles of knowledge transfer in the field of soil biology and chemistry to agricultural production |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) use knowledge in the field of biogeochemistry to creatively identify, formulate and innovatively solve complex problems and perform research tasks in the discipline of agriculture and horticulture |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Evaluations – a critical approach<br>a) critical evaluation of scientific achievements within the discipline of agriculture and horticulture |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | | | x | |
| P8S_WG_b | | | | | x | |
| P8S_WG_c | | | | | x | |
| P8S_WK_c | | | | | x | |
| P8S_UW_a | | | | | x | |
| P8S_KK_a | | | | | x | |

## 6. LITERATURE

**Basic Literature**

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6. Pierwiastki śladowe w geo- i biosferze. A. Kabata-Pendias, B. Szteke. Wydawnictwo IUNG-PIB, Puławy, 2012.
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9. Ochrona gleb i rekultywacja terenów zdegradowanych. A. Karczewska A. UP Wrocław , 2017.

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**Additional Literature**

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8. Ochrona i rekultywacja środowiska. F. Maciak. Wydawnictwo SGGW, 2003.
9. Podstawowe metody laboratoryjnej analizy gleby. E. Tyszkiewicz, R. Czubaszek, S. Roj-Rojewski Wydawnictwo: Politechnika Białostocka, 2019.
10. Humic Substances and Chemical Contaminants. Red: C.E. Clapp, M.H.B. Hayes, N. Senesi, P.R. Bloom, P.M. Jardine. SSCA, Medison, USA, 2001.

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.rio.III |
| Item Name | **A block of subjects from the discipline of *agriculture and horticulture* to choose from: AGRICULTURAL BIOTECHNOLOGY** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Krzysztof Gęsiński, prof. PBŚ |

## 2. DIVISION INTO SEMESTERS, NUMBER OF HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **30** | dr hab. inż. Krzysztof Gęsiński, prof. PBŚ,<br>dr hab. inż. Anna Baturo-Cieśniewska,<br>dr hab. inż. Grzegorz Lemańczyk, prof. PBŚ,<br>dr hab. inż. Dariusz Pańka , prof. PBŚ,<br>prof. dr hab. inż. Elwira Śliwińska,<br>dr hab. inż. Iwona Jędrzejczyk, prof. PBŚ,<br>dr hab. inż. Anna Figas,<br>dr hab. inż. Dariusz Kulus prof. PBŚ,<br>dr hab. inż. Justyna Lema-Rumińska, prof. PBŚ,<br>dr Beata Szala. |

Biological invasions – causes and consequences. Possibilities of specific and non-specific identification of microorganisms. Molecular diagnostics of plant pathogens. Molecular detection of air pollution by microorganisms in practice. Practical use of PCR techniques in plant protection. SMOs symbiotically modified organisms – pros and cons.

Genome sequencing - a breakthrough in genetics, agriculture and medicine. Seed refinement and quality testing. Methods of plant genome analysis. *Silphium perfoliatum* L. - a plant with potentially multidirectional use. Cryogenics in the protection of plant genetic resources. Plant production in the laboratory *of in vitro cultures.*

Production of secondary metabolites of plants in bioreactors. The importance of bacteria in the processes of biodegradation of agricultural waste and environmental protection. Bacterial biopreparations regulating the development, health and yielding of crops.

## 3. TEACHING METHODS

Multimedia lecture.

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies<br>a) to the extent enabling the revision of the existing paradigms in the field of agricultural biotechnology – including the global achievements, including theoretical foundations and general issues and selected specific issues related to this knowledge |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies<br>b) main development trends in agricultural production biotechnology |
| P8S_WG_c | Scope and depth – completeness of cognitive perspective and dependencies<br>c) scientific research methodology for agricultural production biotechnology |
| P8S_WK_c | Context – conditions, effects<br>c) basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to the results of biotechnological research |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) use knowledge in the field of agricultural biotechnology to creatively identify, formulate and innovatively solve complex problems and perform research tasks in the discipline of agriculture and horticulture |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Evaluations – a critical approach<br>a) critical evaluation of scientific achievements within the discipline of agriculture and horticulture |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | | | x | |
| P8S_WG_b | | | | | x | |
| P8S_WG_c | | | | | x | |
| P8S_WK_c | | | | | x | |
| P8S_UW_a | | | | | x | |
| P8S_KK_a | | | | | x | |

## 6. LITERATURE

**Basic Literature**

- Tokarska-Guzik B., Dojdak Z., Zając M., Zajęc A., Urbisz A., Danielewicz W., Hołdyński C. 2012. Rośliny obcego pochodzenia w Polsce ze szczególnym uwzględnieniem gatunków inwazyjnych. GDOŚ W-wa.
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- Muhammad Azhar Nadeem, Muhammad Amjad Nawaz, Muhammad Qasim Shahid, Yıldız Doğan, Gonul Comertpay, Mehtap Yıldız, Rüştü Hatipoğlu, Fiaz Ahmad, Ahmad Alsaleh, Nitin Labhane, Hakan Özkan, Gyuhwa Chung & Faheem Shehzad Baloch. 2018. DNA molecular markers in plant breeding: current status and recent advancements in genomic selection and genome editing, Biotechnology & Biotechnological Equipment, 32:2, 261-285
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- Nguyen T., Hosaka N.M., Kee Y.P., 2014 Optimization of ginseng cell culture in airlift bioreactors anddeveloping the large-scale production system. Industrial Crops and Products 60: 343–348.
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**Additional Literature**

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POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.rio.IV |
| Item Name | **A block of subjects from the discipline of *agriculture and horticulture* to choose from:**<br>**MODERN METHODS OF SOIL-PLANT RESEARCH** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Joanna Lemanowicz, prof. PBŚ |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **30** | prof. dr hab. M. Kobierski,<br>prof. dr hab. B. Dębska,<br>dr hab. inż. A. Siwik-Ziomek, prof. PBŚ,<br>dr hab. inż. L. Gałęzewski, prof. PBŚ<br>dr hab. inż. Roman Rolbiecki, prof. PBŚ,<br>dr hab. inż. J. Bauza-Kaszewska, prof. PBŚ,<br>dr hab. inż. A. Figas,<br>prof. dr hab. inż. Anna Wenda Piesik,<br>dr hab. inż. Grzegorz Lemańczyk, prof. PBŚ,<br>prof. dr hab. D. Piesik,<br>dr hab. inż. Dariusz Kulus, prof. PBŚ<br>dr hab. inż. I. Jędrzejczyk, prof. PBŚ<br>dr hab. inż. T. Knapowski, prof. PBŚ,<br>dr hab. inż. E. Wszelaczyńska, prof. PBŚ,<br>dr hab. inż. J. Poberężny, prof. PBŚ |

1. Innovative use of aluminosilicate minerals.
2. Modern instrumental techniques used in the study of humic substances.
3. Extracting, cleaning enzymes and measuring their activity.
4. Methods of measuring soil moisture.
5. Modern research methods in the assessment of the needs and effects of plant irrigation and improvement of irrigation control.
6. Modern methods of treatment of organic waste and by-products used in agriculture.
7. The use of bioindicator plants to assess the state of the environment.
8. Analysis of crop growth using physiological indicators.
9. Studies on the soil-plant-pathogen tri-trophic system in terms of the severity of infectious diseases.
10. Methods of catching and breeding insects and the possibility of observing their behavior with the use of olfactometers.
11. Methods of protection and identification of plant genetic resources.
12. DNA barcoding in species identification.
13. The quality of technological indicators determining the use of grain and flour for food purposes.
14. The health-promoting value of vegetables resulting from storage technology.
15. The technological value of the potato depending on the innovative cultivation methods.

## 3. TEACHING METHODS

| |
|---|
| Lecture - 30 hours |

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies<br>a) to the extent that it is possible to revise the existing paradigms – the global achievement, including the theoretical foundations and methodology of scientific research with the use of advanced techniques and research tools in the discipline of *agriculture and horticulture*. |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies<br>b) the main development trends of research methods used in the discipline of *agriculture and horticulture* |
| P8S_WG_c | Context – conditions, effects<br>c) aspects related to the methodology of scientific research for the discipline of agriculture and horticulture |
| P8S_WK_c | Context – conditions, effects<br>c) basic principles of knowledge transfer and research results to economic entities operating in the agricultural field and commercialization of the results of scientific activity and know-how related to these results for the discipline *of agriculture and horticulture* |
| SKILLS: can | |
| P8S_UW_a | Leveraging knowledge – problems solved and tasks performed<br>a)The use of knowledge, technology, research tools for creative solving of complex methodological problems typical of the discipline of *agriculture and horticulture* |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Evaluations – a critical approach<br>a) critically analyse and evaluate the latest methods of scientific research, expert activity and other creative work and their contribution to the development of knowledge within the discipline *of agriculture and horticulture* |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | | | x | |
| P8S_WG_b | | | | | x | |
| P8S_WG_c | | | | | x | |
| P8S_WK_c | | | | | x | |
| P8S_UW_a | | | | | x | |

| | | | | | | |
|---|---|---|---|---|---|---|
| P8S_KK_a | | | | | x | |

## 6. LITERATURE

**Basic Literature**

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Editor(s): Sukanta Mondal, Ram Lakhan Singh, Advances in Animal Genomics, Academic Press, 2021, Pages 299-308, ISBN 9780128205952
7) Gałęzewski L., 2020. Wilgotność gleby - metodyczny aspekt badań rolniczych. Wydawnictwa uczelniane UTP w Bydgoszczy, 124 s.
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9) Wierzbicka, M. 2015. Ekotoksykologia rośliny, gleby, metale. Warszawa: Wydawnictwo Uniwersytetu Warszawskiego
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15) Sarbak Z., 2009. Nieorganiczne materiały nanoporowate. Wydawnictwo Naukowe UAM
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**Additional Literature**

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2. Świderski F., Waszkiewicz-Robak B. 2010: Towaroznawstwo żywności przetworzonej z elementami technologii. SGGW, Warszawa

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10. Schulze E.D., Beck E., Buchmann N., Clemens S., Müller-Hohenstein K., Scherer-Lorenzen M. ed. 2019. Plant Ecology. Second Edition, Springer-Verlag GmbH Germany.
11. Schinner, F., Öhlinger, R., Kandeler, E., & Margesin, R. (Eds.). 2012. *Methods in soil biology*. Springer Science & Business Media.
12. Sadkiewicz J., Sadkiewicz J. 2009. Badania parametrów technologicznych ziarna, mąki i pieczywa. Wyd. Uczelniane UTP Bydgoszcz.Informacje o urządzeniach do badania zbóż, mąki i pieczywa, Zakład Badawczy Przemysłu Piekarskiego w Bydgoszczy, http://zbpp.com.pl/index_pl.php?cid=8
13. Biotechnologia – kwartalnik wydawany przez Komitet Biotechnologii PAN
14. Cademartiri L., Ozin G.A., 2012. Nanochemia. Podstawowe koncepcje. Wydawnictwo Naukowe PWN
15. Przewodnik metodyczny do badań materii organicznej gleb. (1999). Red. H. Dziadowiec i S.S. Gonet, Prace Komisji Naukowych PTG, 120, Bydgoszcz.

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.zir.I |
| Item Name | **A block of subjects from the discipline of *animal science and fisheries* to choose from: ECOTECHNOLOGIES** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Radomir Graczyk |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **30** | dr inż. Bogusław Chachaj, dr hab. inż. Radomir Graczyk |
| The concept of sustainable development. Natural resource management. Environmental management in Poland. Enterprise Environmental Management. Eco-design. Energy policy, energy sources and production. Waste management. Ecotechnologies in rural areas (plant and animal production). | | |

## 3. TEACHING METHODS

Lectures – 15 hours
Lectures, multimedia presentations

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Understands the concept of sustainable development and the principles of rational use of natural resources. Knows the principles of environmental management at various levels. He knows the specifics of management in enterprises related to animal production and fishing. |
| P8S_WG_b | It understands what the energy policy implemented today is and understands the need for transformation in the future. He knows what responsible waste management in plant and animal production is all about. |
| P8S_WG_c | Context – conditions, effects<br>c) knows the methodology of scientific research for a scientific discipline related to ecotechnology |

| | |
|---|---|
| P8S_WK_c | It shows understanding of the need to develop eco-technologies in rural areas. is aware of the importance of eco-technologies for the competitiveness of agri-food enterprises.<br>c |
| SKILLS: can | |
| P8S_UW_a | He/she is able to propose schemes for correct environmental management, can indicate innovative methods of eco-design. It can propose rational solutions related to the management of natural resources. Knows how to propose innovative solutions in the field of environmental management. |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | It is critical of all solutions with a view to sustainable development and care for the natural environment. |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | | x | | |
| P8S_WG_b | | | | x | | |
| P8S_WG_c | | | | x | | |
| P8S_WK_c | | | | x | | |
| P8S_UW_a | | | | x | | |
| P8S_KK_a | | | | x | | |

## 6. LITERATURE

**Basic Literature**

1. Poskrobko B., Poskrobko T., 2012. Zarządzanie środowiskiem w Polsce, PWE, Warszawa.
2. Rosik-Dulewska C., 2021. Podstawy gospodarki odpadami. PWN, Warszawa.
3. Bogda A., Kabała C., Karczewska A., Szopka K., 2011. Zasoby naturalne i zrównoważony rozwój. Wydawnictwo Uniwersytetu Przyrodniczego we Wrocławiu. 460s.

**Additional Literature**

1. Stachura, M., Karwasz, A., 2007. Ekoprojektowanie w praktyce. Zeszyty Naukowe Politechniki Poznańskiej. Budowa Maszyn i Zarządzanie Produkcją, 5 , 51-61.
2. Łuczka W., 2021. Procesy rozwojowe rolnictwa ekologicznego i ich ekonomiczno-społeczne uwarunkowania. Scholar.
3. Szymańska J., 2012. Gospodarowanie zasobami ziemi w Polsce: aspekty teoretyczne i praktyczne. Monografie i Opracowania Uniwersytetu Ekonomicznego we Wrocławiu. 208, 308.

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.zir.II |
| Item Name | **A block of subjects from the discipline of *animal science and fisheries* to choose from: BIOINFORMATICS** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Beata Sitkowska, prof. PBŚ |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **30** | dr hab. inż. Beata Sitkowska, prof. PBŚ |
| Use of bioinformatics resources, tools and software. Searching for information in biological databases. Biomedical literature. Familiarization with the resources of biological databases NCBI and Ensembl. Use of tools: Expression Atlas, BIOMART, GENEBUILD – REACTOME. Creation, analysis, search and matching of sequences of genetic material from plants and animals. Phylogenetic analyses of living organisms. | | |

## 3. TEACHING METHODS

Classes – 30 hours
Working on computers.

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Understands the concept of biological and bioinformatics databases. Verifies the information needed for biotechnological analyses. |
| P8S_WG_b | Understands the main development trends and directions of changes in information placed in biological databases. |
| P8S_WG_c | He knows the methodology of scientific research based on the analysis of projects in the field of bioinformatics. |
| P8S_WK_c | He knows the possibilities of transferring bioinformatics knowledge to the economic sphere, mainly related to agriculture. |
| SKILLS: can | |
| P8S_UW_a | He uses modern research tools in the field of bioinformatics, has the ability to search, understand, analyze and creatively use the necessary information from various sources. |
| SOCIAL COMPETENCE: is ready to | |

| | |
|---|---|
| P8S_KK_a | He is critical of all solutions related to bioinformatics and its application in agriculture. Can analyze different approaches and choose the right ones. |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | X | | | |
| P8S_WG_b | | | X | | | |
| P8S_WG_c | | | X | | | |
| P8S_WK_c | | | X | | | |
| P8S_UW_a | | | X | | | |
| P8S_KK_a | | | X | | | |

## 6. LITERATURE

**Basic Literature**

1. Baxevanis A.D. (red.), Ouellette B.F.F. (red.), 2005. Bioinformatyka. Podręcznik do analizy genów i białek, PWN
2. Jin Xiong J., 2010. Podstawy bioinformatyki, WUW
3. Higgs P.W., Attwood T.K., 2008. Bioinformatyka i ewolucja molekularna, PWN

**Additional Literature**

1. Materiały edukacyjne na stronach internetowych: http://www.ncbi.nlm.nih.gov oraz http.ebi.ac.uk
2. Pevsner J. (red.), 2015. Bioinformatics and Functional Genomics. UK, Wiley-Blackwell.
3. Kolenda M., Sitkowska B. 2021. The polymorphism in various milk protein genes in Polish Holstein-Friesian dairy cattle. Animals 11(2), 389.
4. Sitkowska B., Kolenda M., 2020. Bioinformatyczne bazy danych w zrównoważonej intensyfikacji hodowli bydła mlecznego. Rozdział w: Zastosowanie współczesnych metod doskonalenia bydła i zarządzania stadem w kontekście ilości i jakości pozyskiwanych produktów, 2-32. Wydawnictwo UR w Krakowie, ISBN 978-83-66602-02-1

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.zir. III |
| Item Name | **A block of subjects from the discipline of *animal science and fisheries*to choose from:**<br>**SCIENCE AND TECHNOLOGY IN SHAPING AGRICULTURAL FIELD** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Mariusz Bogucki, prof. PBŚ |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15** | dr hab. inż. Mariusz Bogucki, prof. PBŚ<br>dr hab. inż. Mirosław Banaszak, prof. PBŚ |
| 1. Agricultural market – importance in the global, European and national economy. Animal production market.<br>2-3. Technologies in the meat production process (pork, beef) and milk. Basics/new trends.<br>4-5. Scientific research in the field of improving the quality of animal products.<br>6-7. Innovative solutions in animal production creating a local/national agricultural market.<br>8-9. Determinants of research trends for the agricultural market.<br>10-11. Monitoring of the quality of the production environment as a tool to improve the competitiveness of the domestic agricultural market.<br>12-13. Dynamics of agricultural market development and sustainable development of the production process.<br>14-15. The role of research centers for the food chain. | | |

## 3. TEACHING METHODS

| |
|---|
| Lecture – 15 hours<br>Auditorium lecture with elements of discussion with elements of project exercises |

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies a) knows the existing, national and world scientific achievements, including basic theoretical and practical issues shaping agricultural markets in the field of animal production technology. |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies b) knows and understands the main development trends of scientific disciplines, including the disciplines of animal husbandry and fisheries, which have a key impact on the technological development of animal agricultural production. |

| | |
|---|---|
| P8S_WG_c | Context – conditions, effects<br>c) knows the methodology of scientific research for a scientific discipline related to animal agricultural production and the formation of the national agricultural market. |
| P8S_WK_c | Context – conditions, effects<br>c) knows and understands the basic principles of the transfer of knowledge in the field of animal agricultural market to the economic and social sphere and commercialization of the results of scientific activity in this area. |
| SKILLS: can | |
| P8S_UW_a | Knowledge use – problems solved and tasks performed<br>a) is able to use knowledge from various fields of science to identify, formulate and solve problems or perform research tasks in the field of improving the quality of products of animal origin, production efficiency and improving the competitiveness of the domestic agricultural market. |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Evaluations – a critical approach<br>a) is ready to evaluate scientific achievements within the discipline of animal husbandry and fisheries concerning the agricultural market – its importance, development, future. |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation* | Discussion | Academic Essay |
| P8S_WG_a | | | | x | | |
| P8S_WG_b | | | | x | | |
| P8S_WG_c | | | | x | | |
| P8S_WK_c | | | | x | | |
| P8S_UW_a | | | | x | | |
| P8S_KK_a | | | | x | | |

* - lectures 8-15 - students will perform an analytical study, a cross-sectional task - submitted in paper form.

## 6. LITERATURE

| **Basic Literature** |
|---|
| 1. Trzmielak D., Grzegorczyk M., Gregor B. 2018. Transfer wiedzy i technologii z organizacji naukowo-badawczych do przedsiębiorstw. Wydawnictwo Uniwersytetu Łódzkiego.<br>2. Warsewicz H., Krajewski K., Świątkowska M. 2013. Marketing żywności, Wolters . Kluwer Sp. z o.o.<br>3. Malchar-Michalska D. 2018. Pionowa koordynacja kontraktów w rolnictwie. Difin. |
| **Additional Literature** |

1. Krzyżanowski J., 2015. Wspólna polityka rolna Unii Europejskiej w Polsce. Wydawnictwo CeDeWu.
2. Rynek rolny, Biuletyn miesięczny. IERiGŻ.
3. Selected scientific articles.
4. Selected legal provisions.

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.zir.IV |
| Item Name | **A block of subjects from the discipline of *animal science and fisheries* to choose from:**<br>**B+R PROJECT MANAGEMENT** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Aleksandra Dunisławska, prof. PBŚ |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15** | dr hab. inż. Aleksandra Dunisławska, prof. PBŚ<br>dr hab. inż. Mirosław Banaszak, prof. PBŚ |

1. Project and its features, R&D projects – definition and characteristics
2. Project management methodologies
3. Organization of communication in the project
4. Project risk management
5. Project quality management
6. Project communication
7. National and international programmes dedicated to young scientists
8. Group workshops – planning and managing your own research project

## 3. TEACHING METHODS

Seminar – 15 hours

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Understands the concept of project work. Verifies the information needed to manage the project. |
| P8S_WG_b | Understands the main development trends and directions of changes in research and development projects |
| P8S_WG_c | Knows the methodology of scientific research based on the analysis of research and development projects |
| P8S_WK_c | He knows the possibilities of transferring design knowledge to the economic sphere, mainly related to agriculture and animal husbandry. |
| SKILLS: can | |
| P8S_UW_a | It uses knowledge from various fields of science to creatively identify, formulate and innovatively solve complex problems or perform tasks of a research nature in projects in disciplines of earth sciences. |

| SOCIAL COMPETENCE: is ready to | |
|---|---|
| P8S_KK_a | He is critical of all solutions related to project management. Can analyze different approaches and choose the right ones. |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | | X | | |
| P8S_WG_b | | | | X | | |
| P8S_WG_c | | | | X | | |
| P8S_WK_c | | | | X | | |
| P8S_UW_a | | | | X | | |
| P8S_KK_a | | | | X | | |

## 6. LITERATURE

| **Basic Literature** |
|---|
| 1. Jerzy Kisielnicki, Zarządzanie projektami badawczo-rozwojowymi, Wydawnictwo Nieoczywiste, 2017<br>2. Robert K. Wysocki, Efektywne zarządzanie projektami, Wydawnictwo Onepress, 2018 |
| **Additional Literature** |
| 1. Ken Blanchard, Spencer Johnson, Jednominutowy Menadżer, Wydawnictwo MT Biznes, 2019<br>2. Ken Blanchard, Jednominutowy Menadżer buduje wydaje zespoły, Wydawnictwo MT Biznes, 2019<br>3. Mike Clayton, Zarządzanie czasem, Wydawnictwo samo sedno, 2011 |

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.zir. V |
| Item Name | **A block of subjects from the discipline of *animal science and fisheries* to choose from:**<br>**ANIMAL RESEARCH MODELS** |
| Course coordinator responsible for preparing the syllabus | prof. dr hab. Maria Siwek-Gapińska |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15** | prof. dr hab. Maria Siwek-Gapińska<br>dr inż. Elżbieta Pietrzak<br>dr inż. Michalina Jawor<br>dr inż. Magdalena Kolenda |
| Animal research models used in biology – species, characteristics, specific use in basic and applied research. Model animals. Animal cell lines. Transgenic animals. Animals knocked out. Organoids. Methods and ethics of conducting research on an animal model. Discussion on the further development of research on the animal model. Ethics of conducting research on an animal model. | | |

## 3. TEACHING METHODS

Lectures – 15 hours
Lectures, multimedia presentations

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Understands the concept of using animal models in both basic and applied research. Knows the principles of using cell lines as alternative models. Knows the specifics of conducting research on an animal model in accordance with the principles of ethics. |
| P8S_WG_b | Understands the use of animal models in basic and applied research. Knows what it means to use model animals responsibly in accordance with the principles of ethical research. |
| P8S_WK_c | Shows understanding of the necessity of applying the 3R principle (reduce, replace, reuse). |
| SKILLS: can | |

| | |
|---|---|
| P8S_UW_a | Can propose alternative research models based on tissue and cell cultures. It can propose rational solutions related to the use of model animals. He is able to propose innovative solutions based on the latest knowledge. |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | He is critical of the use of model animals in basic and applied research. |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | | x | | |
| P8S_WG_b | | | | x | | |
| P8S_WG_c | | | | x | | |
| P8S_WK_c | | | | x | | |
| P8S_UW_a | | | | x | | |
| P8S_KK_a | | | | x | | |

## 6. LITERATURE

**Basic Literature**

1. The current state of animals models in research: A review. Robinson N. et al., International Journal of Surgery, 2019, 72, 9 – 13
2. Thoughts on limitations of animal models, Hartung. Parkinsonisms & Related Disorders, 2008, 14.
3. Organoids by design. Takebe T. & Wells J. Science, 2019, 364, 956 – 959
4. Intestinal organoids in farm animals. Beaumont M., et al., Veterinary Research, 2021, 52, 33.

**Additional Literature**

Additional literature will be provided during classes based on the latest publications on the subject matter.

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 12.zir.VI |
| Item Name | **A block of subjects from the discipline of *animal science and fisheries* to choose from: NEXT-GENERATION FOOD** |
| Course coordinator responsible for preparing the syllabus | dr hab. inż. Aleksandra Dunisławska, prof. PBŚ |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VI** | **15** | dr hab. inż. Aleksandra Dunisławska, prof. PBŚ<br>dr inż. Elżbieta Pietrzak |

1. Definitions, classification and legal conditions related to the classification of raw materials or food products referred to as "novel food".
2. Types of food of the new generation.
3. Attribution food
4. Probiotic foods
5. In vitro *food*
6. Types of novel foods: functional, convenience and transgenic foods.
7. GMOs in new generation food - definition, health safety.
8. Directions of research on genetically modified foods.
9. Technologies used in industrial food production.
10. Characteristics of selected plant raw materials approved for use as "novel food ingredients"

## 3. TEACHING METHODS

Lecture – 15 hours

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Understands the concept of next-generation food. Verifies information in the field of food production |
| P8S_WG_b | Understands the main development trends and directions of changes in the production of new generation food |
| P8S_WG_c | Knows the methodology of scientific research in the field of next-generation food production and food safety |
| P8S_WK_c | He knows the possibilities of transferring knowledge in the field of new generation food production to the economic sphere, mainly related to agriculture |

| | |
|---|---|
| SKILLS: can | |
| P8S_UW_a | It uses knowledge from various fields of science to creatively identify, formulate and innovatively solve complex problems. |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | He is critical of all solutions related to food production. Can analyze different approaches and choose the right ones. |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | X | | | |
| P8S_WG_b | | | X | | | |
| P8S_WG_c | | | X | | | |
| P8S_WK_c | | | X | | | |
| P8S_UW_a | | | X | | | |
| P8S_KK_a | | | X | | | |

## 6. LITERATURE

**Basic Literature**

1. Aleksandra Barody, Leszek Woźniak. Produkty nowej generacji, wydawnictwo Difin, 2019
2. Paweł Konrad Tuszyński, Probiotyki i prebiotyki – kompendium wiedzy dla farmaceutów i lekarzy, wydawnictwo farmaceutyczne, 2021
3. Elżbieta Goryńska-Goldmann, Weronika Mytko, Zrównoważona konsumpcja żywności. Wybrane działania wspierające jej rozwój, wydawnictwo Difin, 2021
4. Alan McHughen, Żywność modyfikowana genetycznie, WNT Wydawnictwa Naukowo-Techniczne, 2004

**Additional Literature**

1. Articles from current literature on the subject of the subject.
2. Applicable legal acts

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# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 13 |
| Item Name | **ACADEMIC ENTREPRENEURSHIP** |
| Course coordinator responsible for preparing the syllabus | dr inż. Mateusz Wirwicki |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VII** | **15** | dr inż. Mateusz Wirwicki<br>mgr Piotr Jankowski |

**Semester VII**
**dr inż. Mateusz Wirwicki - 10 hours**
**mgr Piotr Jankowski - 5 hours**

1. Academic entrepreneurship – how much learning in business? - 1.5 hours
2. Commercialization – types and forms of learning transfer to business – 1.5 hours
3. Financing of academic enterprises - 1.5 hours
4. Business Model Canvas – 3 hours
5. Conditions for the establishment and functioning of academic enterprises. Planning and building a spin off/ spin out venture - 3 hours
6. Conditions and forms of knowledge transfer. Relations between the sphere of science and business. Concepts and principles in the field of industrial property protection and copyright related to the creation of new ventures - 3 hours
7. Business model presentation – 1.5 hours

## 3. TEACHING METHODS

Lecture – 15 hours
multimedia presentation, demonstration, discussion, lecture, case method, informative lecture, conversational lecture, problem-based lecture

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_d | Scope and depth – completeness of cognitive perspective and dependencies<br>d) principles of dissemination of the results of scientific activity for the sphere of business |
| P8S_WK_c | Context – conditions, effects<br>c) basic principles of knowledge transfer to the economic and social sphere and commercialization of the results of scientific activity and know-how related to these results |

| SKILLS: can | |
|---|---|
| P8S_UW_c | Knowledge use – problems solved and tasks performed<br>c) transfer the results of scientific activity to the economic and social sphere in the form of academic entrepreneurship |
| P8S_UK_b | Communication – receiving and creating statements, disseminating knowledge in the scientific community and using a foreign language<br>b) disseminate the results of scientific activity, also in forms popular within the framework of academic entrepreneurship |
| P8S_UO_a | Work organization – planning and teamwork<br>a) plan and implement individual and team research or creative projects in the academic environment |
| P8S_UU_a | Learning – planning your own development and the development of others<br>a) independently plan and act for their own development and inspire and organize the development of others in the field of academic entrepreneurship organization |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KO_c | Responsibility – fulfilling social obligations and acting for the public interest<br>c) think and act in an entrepreneurial way in business |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_d | | | | X | | |
| P8S_WK_c | | | | X | | |
| P8S_UW_c | | | | X | | |
| P8S_UK_b | | | | X | | |
| P8S_UO_a | | | | X | | |
| P8S_UU_a | | | | X | | |
| P8S_KO_c | | | | X | | |

## 6. LITERATURE

**Basic Literature**

1. Mariusz-Jan Radło, Michał Baranowski, Tomasz Napiórkowski, Jarosław Chojecki, Komercjalizacja, wdrożenia i transfer technologii definicje i pomiar dobre praktyki wybranych krajów, Oficyna Wydawnicza SGH, Warszawa 2020;
2. Urząd Marszałkowski Województwa Mazowieckiego w Warszawie, Komercjalizacja Wyników Badań naukowych Praktyczny poradnik dla naukowców, Warszawa 2013
3. Korytkowski P., Kulczycki E., Opis wpływu działalności naukowej na funkcjonowanie społeczeństwa i gospodarki. Podręcznik dla ewaluowanych podmiotów, 2019
4. Jan Bagiński, Aleksander Buczacki, Krzysztof Santarek, Anna Szerenos, Dariusz Sobczak, Transfer technologii z uczelni do biznesu, tworzenie mechanizmów transferu technologii, Polska Agencja Rozwoju Przedsiębiorczości, Warszawa 2008
5. Banerski G, Gryzik A., Matusiak K. B., Mażewska M., Stawasz E., „Przedsiębiorczość akademicka (rozwój firm spin-off, spin-out) – zapotrzebowanie na szkolenia służące jej rozwojowi" Raport z badania, Wyd. Polska Agencja Rozwoju Przedsiębiorczości, Warszawa 2009r. - https://www.efs.2007-

2013.gov.pl/AnalizyRaportyPodsumowania/baza_projektow_badawczych_efs/Documents/przedsiebiorczosc_akademicka_raport30032011.pdf
6. Barski R., Cook T. „Metodyka identyfikacji projektów do komercjalizacji na wyższych uczelniach", PARP, Warszawa, 2011 - https://www.pi.gov.pl/PARPFiles/file/metodyka_identyfikacji.pdf
7. Santarek K. (red.) „Transfer technologii z uczelni do biznesu", Wyd. Polska Agencja Rozwoju Przedsiębiorczości, Warszawa 2008 r. - https://www.parp.gov.pl/files/74/81/194/4372.pdf
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**Additional Literature**

1. Wissema J. G., „Technostarterzy - Dlaczego i jak?" Wyd. Polska Agencja Rozwoju Przedsiębiorczości, Warszawa 2005.
2. Charnas T. (red.) „Z innowacją w biznes" INFOR Training, Kraków 2010.
3. Trzmielak D., Zehner W., „Metodyka i organizacja doradztwa w zakresie transferu technologii i komercjalizacji wiedzy", PARP, Warszawa, 2011.
4. Kowalczyk I., Pawłowska J., Sarti F., Zago Biasetti I., „Metody inkubacji projektów biznesowych", PARP, Warszawa, 2011.
5. Your Guide to IP Commercialisation - The European IP Helpdesk - https://www.iprhelpdesk.eu/sites/default/files/2018-12/european-ipr-helpdesk-your-guide-to-ip-commercialisation.pdf
6. The role of public support in the commercialisation of innovations – Report - http://ec.europa.eu/commfrontoffice/publicopinion/flash/fl_394_en.pdf
7. Gródek-Szostak Z., "Transfer of technology in practice" - http://www.imim.pl/PHD/www.imim-phd.edu.pl/contents/Lectures/GRODEK%20SZOSTAK%20Commercialization%20of%20scientific%20research.pdf

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 14 |
| Item Name | **INTERNSHIP** |
| Course coordinator responsible for preparing the syllabus | prof. dr hab. inż. Dariusz Skibicki |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **VII** | **30** | prof. dr hab. inż. Dariusz Skibicki |
| Participation or independent teaching with students at the Bydgoszcz University of Technology. Classes are organized and supervised by the doctoral student's supervisor. | | |
| **VIII** | **30** | prof. dr hab. inż. Dariusz Skibicki |
| Participation or independent teaching with students of Bydgoszcz University of Technology. Classes are organized and supervised by the doctoral student's supervisor. | | |

## 3. TEACHING METHODS

Participation in classes or conducting classes on their own.

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| SKILLS: can | |
| P8S_UK_c | Communication – receiving and creating statements, disseminating knowledge in the scientific community and using a foreign language<br>c) initiate a debate with students |
| P8S_UO_a | Work organization – planning and teamwork<br>a) Can plan and implement individual and team research or creative projects with domestic or foreign students |
| P8S_UU_a | Learning – planning your own development and the development of others<br>a) Is able to independently plan and act for his/her own development and inspire and organize the development of other people, including Polish and foreign students |
| P8S_UU_b | Learning – planning your own development and the development of others<br>b) Can plan classes or groups of classes with students and implement them using modern methods and tools |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | ~~Discussion~~ Visit | Academic Essay |
| P8S_UK_c | | | | | X | |
| P8S_UO_a | | | | | X | |
| P8S_UU_a | | | | | X | |
| P8S_UU_b | | | | | X | |

## 6. LITERATURE

| **Basic Literature** |
|---|
| Not applicable |
| **Additional Literature** |
| Not applicable |

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# SYLLABUS

## 1. ITEM INFORMATION

| | |
|---|---|
| Plan Item | 15 |
| Item Name | **DISSERTATION WORKSHOP** |
| Course coordinator responsible for preparing the syllabus | prof. dr hab. inż. Dariusz Skibicki |

## 2. DIVISION INTO SEMESTERS, HOURS AND CURRICULUM CONTENT

| semester | hours | Host |
|---|---|---|
| **And** | **15** | Disciplines of engineering and technical sciences<br>prof. dr hab. inż. Janusz Sempruch<br>prof. dr hab. inż. Dariusz Skibicki<br>prof. dr hab. inż. Dariusz Boroński<br><br>Disciplines of natural sciences<br>prof. dr hab. inż. Maria Siwek-Gapińska<br>dr hab. inż. Roman Rolbiecki |

**Doctoral school and doctoral dissertation**

The lecture discusses: the regulations of the doctoral school, the education plan at the doctoral school, the division into fields and disciplines of science in Poland and in the world, the system of academic degrees and titles in Poland and in the world, the problem of what science is, what is a doctoral dissertation, what are the statutory requirements for it, what is the structure of the dissertation, what does the review of a doctoral dissertation look like, what is the course of the doctoral dissertation defense.

As part of the seminar part, an analysis of examples of doctoral dissertations is conducted. Presentations of selected doctoral dissertations are prepared by doctoral students.

| | | |
|---|---|---|
| **II** | **15*** | Disciplines of engineering and technical sciences<br>prof. dr hab. inż. Janusz Sempruch<br>prof. dr hab. inż. Dariusz Skibicki<br>prof. dr hab. inż. Dariusz Boroński<br><br>Disciplines of natural sciences<br>prof. dr hab. inż. Maria Siwek-Gapińska<br>dr hab. inż. Roman Rolbiecki |

*subject taught separately in a discipline or group of disciplines

**Preparation of an individual research plan**

PhD students present their proposals for individual research plans. Initially, doctoral students present the genesis of their research problem. Then they formulate the individual elements of the Individual Research Plan: the title of the dissertation, the research objective or hypothesis; expected results, contribution to the development of the discipline, research tasks, publication of a scientific article, scientific internship,

dissertation preparation plan. Presentation of complete IRPs by individual PhD students combined with discussion, submission of comments and suggestions. In addition, as part of the course, doctoral students will learn about the Regulations of the procedure for awarding or refusing to award a doctoral degree at PBS; with the Code of the National Science Centre on the integrity of scientific research and applying for research funding.

| | | |
|---|---|---|
| **III** | **15*** | Disciplines of engineering and technical sciences<br>prof. dr hab. inż. Janusz Sempruch<br>prof. dr hab. inż. Dariusz Skibicki<br>prof. dr hab. inż. Dariusz Boroński<br><br>Disciplines of natural sciences<br>prof. dr hab. inż. Maria Siwek-Gapińska<br>dr hab. inż. Roman Rolbiecki |

*- subject taught separately in a group of disciplines

**Literature Studies**

On the basis of the "aims and scope" of the journal and the list of journals of the ministry, the doctoral student is able to identify journals in his discipline. On the basis of the Impact Factor and the scoring of the list of journals of the Ministry, it is able to determine the rank of a journal.
The PhD student gets acquainted with the managers of scientific publications such as EndNote, Publons, Mendeley.
The doctoral student presents the results of literature studies related to the subject of his doctoral dissertation. On this basis, the student is able to identify the most important research trends in his scientific discipline and indicate the place of his research topic against this background. Can justify the purpose and scope of his dissertation.

| | | |
|---|---|---|
| **IV** | **15*** | Disciplines of engineering and technical sciences<br>prof. dr hab. inż. Janusz Sempruch<br>prof. dr hab. inż. Dariusz Skibicki<br>prof. dr hab. inż. Dariusz Boroński<br><br>Disciplines of natural sciences<br>prof. dr hab. inż. Maria Siwek-Gapińska<br>dr hab. inż. Roman Rolbiecki |

*- subject taught separately in a group of disciplines

**Preparing for the mid-term evaluation**

The doctoral student prepares and consults a report and presentation for mid-term evaluation. In addition, the PhD student becomes familiar with the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers (HR Excellence in Research logo). The doctoral student learns about the elements of ethics and responsibility applied in scientific research, taking into account, m.in, ethical planning, implementation and publication of research results. A PhD student resolves issues related to copyright, conflicts of interest and liability in the implementation of multi-author research.

| | | |
|---|---|---|
| **V** | **15*** | Disciplines of engineering and technical sciences<br>prof. dr hab. inż. Janusz Sempruch<br>prof. dr hab. inż. Dariusz Skibicki |

| | | |
|---|---|---|
| | | prof. dr hab. inż. Dariusz Boroński<br><br>Disciplines of natural sciences<br>prof. dr hab. inż. Maria Siwek-Gapińska<br>dr hab. inż. Roman Rolbiecki |

*- subject taught separately in a group of disciplines

**Description of the research workshop**

The PhD student presents his or her research workshop: the test bench, measuring instruments, the software used, the research methods used, data analysis, etc. He pays particular attention to the elements of the workshop designed and made by himself.

| | | |
|---|---|---|
| **VI** | **15*** | Disciplines of engineering and technical sciences<br>prof. dr hab. inż. Janusz Sempruch<br>prof. dr hab. inż. Dariusz Skibicki<br>prof. dr hab. inż. Dariusz Boroński<br><br>Disciplines of natural sciences<br>prof. dr hab. inż. Maria Siwek-Gapińska<br>dr hab. inż. Roman Rolbiecki |

*- subject taught separately in a group of disciplines

**Characteristics of scientific supervisors and research units**

The doctoral student prepares a description of the scientific profile of the supervisor, including the scope of his scientific interests, scientific achievements, bibliometric indicators. Examples of career paths of the world's best scientists; scientometric tools; developing a scientist's profile in dedicated social media (e.g. EURAXESS); development of a scientific curriculum vitae; harmonious and conscious management of a scientific career.

The doctoral student prepares the characteristics of the scientific unit in which the supervisor is employed, m.in. the scientific profile of the unit, its research facilities: machines, devices, software and the scope of cooperation with the economic environment.

| | | |
|---|---|---|
| **VII** | **15** | prof. dr hab. inż. Janusz Sempruch |

**Presentation of the results of own research**

The PhD student presents the results of his own research. It discusses methods of analyzing results. The results are discussed and conclusions are formulated.

| | | |
|---|---|---|
| **VIII** | **15** | prof. dr hab. inż. Dariusz Skibicki |

**Presentation of the self-report**

1. Explanation of the procedure for submitting a doctoral dissertation at the Doctoral School (APD and JSA).
2. Summary of education – doctoral students evaluate education and propose changes to the education process.

3. What is science? – discussion on the scientific procedure, what strictly research elements I performed, discussion of cognitive biases, explanation of the limitations of science.
4. A PhD student learns to evaluate and analyse scientific fields using tools such as SCImago Journal & Country Rank and Claritive Essential Science Indicators. It analyzes the research results of leading institutions, countries, journals, authors and articles. The PhD student identifies research trends in technical and natural sciences.
5. The doctoral student presents a self-report prepared for the defense of his doctoral dissertation.

## 3. TEACHING METHODS

Lecture – 8 hours
Seminar – 7 hours
Classes are held in the form of a lecture and a seminar

## 4. LEARNING OUTCOMES FOR THE COURSE

| Reference to learning outcomes | Description of the learning outcomes for the course |
|---|---|
| KNOWLEDGE: knows and understands | |
| P8S_WG_a | Scope and depth – completeness of cognitive perspective and dependencies<br>a) A PhD student understands the paradigm of modern science. He understands what science is. He is familiar with the specifics of the disciplines represented in the doctoral school. |
| P8S_WG_b | Scope and depth – completeness of cognitive perspective and dependencies<br>b) by actively and passively participating in interdisciplinary seminars, learns about the main development tendencies of groups of natural and engineering and technical disciplines, |
| P8S_WG_c | Scope and depth – completeness of cognitive perspective and dependencies<br>c) when developing an individual research plan, familiarises themselves with the methodology of scientific research specific to their scientific discipline |
| SKILLS: can | |
| P8S_UK_a | Communication – receiving and creating statements, disseminating knowledge in the scientific community and using a foreign language<br>a) when presenting his/her scientific achievements, he/she is able to communicate on specialist topics to the extent that allows active participation in the international scientific community |
| P8S_UK_c | Communication – receiving and creating statements, disseminating knowledge in the scientific community and using a foreign language<br>c) when presenting his/her scientific achievements, he/she is able to initiate a debate on them |
| P8S_UK_d | Communication – receiving and creating statements, disseminating knowledge in the scientific community and using a foreign language<br>d) participate in an interdisciplinary scientific discourse on the achievements of themselves and other doctoral students |
| P8S_UU_a | Learning – planning your own development and the development of others<br>a) when preparing an individual research plan, is able to independently plan his/her scientific development and act for his/her own development |
| P8S_UU_b | Learning – planning your own development and the development of others<br>b) when presenting his/her scientific achievements, he/she is able to plan classes and implement them with the use of modern methods and tools |
| SOCIAL COMPETENCE: is ready to | |
| P8S_KK_a | Evaluations – a critical approach |

| | |
|---|---|
| | a) when characterizing supervisors and the research unit, is ready to critically evaluate the achievements within a given scientific discipline |
| P8S_KK_b | Evaluations – a critical approach<br>b) when presenting a self-report, is ready to critically evaluate his/her own contribution to the development of a given scientific or artistic discipline |
| P8S_KK_c | Evaluations – a critical approach<br>c) by describing his/her research workshop, he/she learns to recognize the importance of knowledge in solving cognitive and practical problems |
| P8S_KR_a | Professional role – independence and ethos development<br>Understands the professional role of a scientist in contemporary society |

## 5. METHODS OF VERIFICATION OF LEARNING OUTCOMES ACHIEVED BY A DOCTORAL STUDENT

| Learning Outcome | Form of assessment | | | | | |
|---|---|---|---|---|---|---|
| | Oral exam | Written exam | Colloquium | Presentation | Discussion | Academic Essay |
| P8S_WG_a | | | | X | | |
| P8S_WG_b | | | | X | | |
| P8S_WG_d | | | | X | | |
| P8S_UK_a | | | | X | | |
| P8S_UK_c | | | | X | | |
| P8S_UK_d | | | | X | | |
| P8S_UU_a | | | | X | | |
| P8S_UU_b | | | | X | | |
| P8S_KK_a | | | | X | | |
| P8S_KK_b | | | | X | | |
| P8S_KK_c | | | | X | | |
| P8S_KR_a | | | | X | | |

## 6. LITERATURE

**Basic Literature**

1. The National Science Centre's Code on the integrity of scientific research and applying for research funding. National Science Centre, 2016.
2. European Charter for Researchers. Code of Conduct for the Recruitment of Researchers. European Commission, 2006
3. Steneck, Nicholas H. ORI introduction to the responsible conduct of research. Government Printing Office, 2007.
4. Regulations of the Doctoral School
5. Act of 20 July 2018. Law on Higher Education and Science

**Additional Literature**

1. Patience, Gregory S., et al. "Intellectual contributions meriting authorship: Survey results from the top cited authors across all science categories." PLoS One 14.1 (2019): e0198117.
2. Van Noorden, Richard. "Online collaboration: Scientists and the social network." Nature news 512.7513 (2014): 126.

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# CRITERION 2

## Method of verification of learning outcomes for qualifications at level 8 of the PRK

# Procedures of the Internal System of Quality Assurance of Education at the Jan and Jędrzej Śniadecki Bydgoszcz University of Science and Technology

POLITECHNIKA
BYDGOSKA
im. Jana i Jędrzeja Śniadeckich

**ORDINANCE No. Z.154.2021.2022**
**Rector of the Bydgoszcz University of Technology**
**Jan and Jędrzej Śniadecki**

of 13 June 2022

**on procedures and templates of documents applicable within the Internal Quality Assurance System for Education**

Pursuant to Article 23(1) and (2)(2) and (11) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2022, item 574, as amended[1]), the following is ordered:

**§ 1.** The Ordinance specifies:

1) procedures of the internal education quality assurance system;
2) a template of a self-assessment report on the activities taken to improve the internal system of Quality Assurance of Education in full-time and part-time first- and second-cycle studies;
3) a template of the recovery programme;
4) A template of a report on corrective actions.

**§ 2.** The following procedures are introduced as part of the Internal Quality Assurance System for Education at the Jan and Jędrzej Śniadecki University of Technology in Bydgoszcz:

1) the procedure for the evaluation of didactic classes, constituting Appendix No. 1 to the Ordinance;
2) the procedure of observation of didactic classes, constituting Appendix No. 2 to the Ordinance;
3) the student satisfaction assessment procedure, constituting Appendix No. 3 to the Ordinance;
4) the graduate satisfaction assessment procedure, constituting Appendix No. 4 to the Ordinance;
5) the procedure of periodic evaluation of diploma theses, constituting Annex No. 5 to the Ordinance.

[1] The amendments to the Act were published in the Journal of Laws of 2022, items 583, 655, 682, 807, 1010, 1079 and 1117.

**§ 3.** Templates of documents used within the procedures of the Internal Education Quality Assurance System are defined:

1) a template of the self-assessment report on the activities taken to improve the Internal Quality Assurance System for Education in full-time and part-time first- and second-cycle studies, constituting Appendix No. 6 to the Ordinance;
2) a template of the recovery programme, constituting Annex No. 7 to the Ordinance;
3)A template of the report on corrective actions taken on the basis of the prepared recovery programme for the previous academic year, constituting Annex No. 8 to the Ordinance.

**§ 4. I oblige the** University employees, students, doctoral students and students of postgraduate studies and advanced training courses to comply with the provisions contained in the procedures of the Internal Education Quality Assurance System.

**§ 5.** I oblige the Dean to familiarize the faculty employees, and in particular the members of the Faculty Education Quality Team, with the content of the ordinance.

**§ 6.** I entrust supervision over compliance with the provisions of this Ordinance to the Vice-Rector for Education and Student Affairs.

**§ 7.** Student and graduate satisfaction assessments and assessments of teaching classes initiated and not completed before the date of entry into force of the Ordinance are carried out according to the previous rules.

**§ 8.** The following orders lose their force:

1) No. Z.70.2018.2019 of 7 June 2019 on the preparation of the faculty's self-assessment report on the activities taken to ensure and improve the Internal Education Quality Assurance System;
2) No. Z.49.2021.2022 of 14 December 2021 on the procedures of the Internal Education Quality Assurance System at the Jan and Jędrzej Śniadecki University of Technology in Bydgoszcz

**§ 9.** The Ordinance enters into force on the day of signing.

**RECTOR**

Prof. Marek ADAMSKI

Bydgoszcz University of Technology

Jan and Jędrzej Śniadecki

Version: I.2022

# EVALUATION OF DIDACTIC CLASSES

# –PROCEDURE

## General provisions

**§ 1.** The assessment of teaching activities is carried out in such a way that the student filling out the questionnaire remains anonymous. The results of the evaluation of didactic classes contain only the average grades for individual criteria from a given class/subject, the number of people taking part in the assessment and the collected comments of students. The results of the evaluation of didactic classes are used to improve the educational process and in the periodic evaluation of academic teachers.

## Goal of the procedure

**§ 2.** The aim of the procedure is to ensure a systematic assessment of the didactic process carried out by people conducting classes at the Bydgoszcz University of Technology.

## Scope of the procedure

**§ 3.** 1. The procedure for the evaluation of didactic classes, hereinafter referred to as the "Procedure", is in force in all didactic units of the Jan and Jędrzej Śniadecki University of Technology in Bydgoszcz and is used to assess the implementation of didactic classes at all forms and levels of education.

2. The procedure applies to all persons participating in the education of students/doctoral students/postgraduate students/participants of further education courses.

3. Whenever an organisational unit is referred to in the Procedure, it should be understood as an organisational unit other than the faculty at which teaching is conducted, i.e. the Doctoral School, the Foreign Language Study and the Physical Education and Sport School.

## Competence and responsibility

**§ 4.** 1. The employees of the Dean's Office are responsible for assigning students/doctoral students to the dean's and class groups.

2. The Vice-Dean for Education and Student Affairs is responsible for:

1) analysis of the results of the evaluation of teaching classes at the faculty;
2) making the results of the evaluation available to the Chairperson of the Faculty Team for the Quality of Education (WZdsJK);
3) determining the criterion of unsatisfactory assessment of the conducted classes;
4) determining the persons with whom the head of the department/department/laboratory is obliged to conduct an interview due to an unsatisfactory assessment of the classes conducted;
5) archiving of evaluation results.

3. The head of an organisational unit is responsible for:

1) analysis of the results of the evaluation of didactic classes conducted by the unit's employees;
2) determining the criterion of unsatisfactory assessment of the conducted classes;
3) determining the persons with whom he is obliged to conduct an interview due to an unsatisfactory assessment of the classes conducted;
4) discussing the results of the evaluation of the conduct of classes at the meeting of the Unit Council;
5) archiving of evaluation results.

4. The Chairman of the WZdsJK shall be responsible for:

1) conducting an analysis of the results of the evaluation of teaching classes at the faculty;
2) determining, together with the Vice-Dean for Education and Student Affairs, the persons with whom the head of the department/department/laboratory will be obliged to conduct an interview due to an unsatisfactory assessment of didactic classes;
3) providing the heads of departments/departments/laboratories with the results of the evaluations of employees of given organizational units along with a list of people with whom the interview should be conducted;
4) preparing the results of the survey and presenting them to the Dean, the Faculty College and at the meeting of the employees of the organizational unit;

5) discussing with the chairmen of the programme councils the assessments of individual fields of study, including the grades of didactic classes in a given field.

5. The head of postgraduate studies/training course is responsible for:

1) conducting research in at least one module/subject in each semester of a given edition;
2) submitting completed questionnaires along with a synthesis of the assessment of teaching classes to the Vice-Dean according to the template specified in Appendix No. 2 to the Procedure.

6. The University Council of Students/PhD Students (URSS/URSD) and the Faculty Student Government Councils (WRSS) are responsible for activities promoting surveys on the evaluation of classes conducted at the Bydgoszcz University of Technology.

7. The IT Department is responsible for:

1) starting and closing the study in the USOS/USOSweb system;
2) generating summary and individual statements, including for each field of study;
3) making individual statements available to academic teachers in the USOSweb system within a week of the end of the survey;
4) submission of summary statements to the Rector's Plenipotentiary for Quality and Evaluation of Education within one week of the completion of the survey;
5) archiving of surveys in the USOS system.

8. The Rector's Plenipotentiary for Quality and Evaluation of Education is responsible for:

1) setting the dates of the start and end of the evaluations of teaching classes at the Bydgoszcz University of Technology;
2) submission of summary statements to the Rector, Vice-Rector for Education and Student Affairs, Deans, Vice-Deans for Education and Student Affairs and heads of organizational units.

**Procedure**

**§. 5.** 1. The evaluation of teaching classes is carried out twice a academic year, in the winter and summer semesters.

2. The assessment of didactic classes is carried out in the following mode:

1) planned – for all classes conducted at the Bydgoszcz University of Technology. The launch of the assessment system takes place two weeks before the start of the winter/summer

examination session. Completion of the assessment of teaching classes one week after the end of the retake examination session;

2) which is managed by the Dean or Vice-Dean for Education and Student Affairs of the Faculty/Chairman of the WZdsJK/Vice-Rector for Education and Student Affairs/Rector's Plenipotentiary for Quality and Evaluation of Education:
   (a) at the written request of the person conducting the classes submitted to the Dean or the Vice-Dean for Education and Student Affairs of the Faculty,
   (b) at the written request of students/doctoral students/starosta submitted to the Dean or Vice-Dean for Education and Student Affairs of the Faculty,
   (c) at the written request of participants of postgraduate studies/advanced training courses submitted to the head of postgraduate studies/additional training course, head of the unit in which the teacher is employed,
   (d) after obtaining information about the absence (in whole or in part) of didactic classes in a given subject,
   (e) for another legitimate reason.

3. The assessment of teaching classes is initiated in the USOS system by the Department of Computer Science of the University of Silesia at the request of the Rector, the Vice-Rector for Education and Student Affairs or the Rector's Plenipotentiary for Quality and Evaluation of Education.

4. After the completion of the process of evaluation of teaching classes, the results are made available in the USOSweb system to each person conducting classes (the results of the evaluation of classes in postgraduate studies and advanced training courses are made available outside the USOS system).

5. Each person conducting classes at the Bydgoszcz University of Technology is obliged to familiarize themselves with the results of the assessment.

**A technique for conducting a survey of the didactic process.**

**§ 6.** 1. Surveys of didactic classes are carried out using:

1)an electronic version of the evaluation questionnaire in the USOSweb system;

2) the assessment questionnaire in paper version (applies to postgraduate studies/advanced training courses and the intervention mode).

2. An evaluation questionnaire constituting Appendix No. 1 to the Procedure is used for the assessment of didactic classes carried out by the persons conducting classes.

3. In the case of conducting the evaluation of teaching classes using the paper evaluation questionnaire, the head of postgraduate studies/in-service course/supervisor of the employee for whom the intervention questionnaire was conducted shall submit the collected questionnaires with a synthesis to the Vice-Dean for Education and Student Affairs no later than one week after the survey was conducted. The questionnaire template is specified in Appendix No. 2 to the Procedure.

### Analysis of the evaluation results and procedure for making them public

**§ 7.** 1. The Rector's Plenipotentiary for Quality and Evaluation of Education shall provide the Deans, Vice-Deans for Education and Student Affairs and heads of organisational units with the aggregate results of the evaluation of teaching classes.

2. The Vice-Dean for Education and Student Affairs and the Chairman of the WZdsJK, and in the case of an organisational unit, the head of this unit, shall analyse and evaluate the results of the surveys.

3. The Vice-Dean for Education and Student Affairs, and in the case of an organisational unit, the head of the organisational unit, on the basis of the analysis carried out, prepares a list of persons with whom direct superiors are obliged to conduct an explanatory interview due to an unsatisfactory assessment or critical remarks regarding the conduct of teaching classes by these persons.

4. The Chairman of the WZsdJK shall forward the results of the evaluation of teaching classes to the direct superiors of the persons conducting the classes, i.e. the heads of departments/departments/laboratories. Heads of departments/departments/laboratories are obliged to discuss the results of the class evaluation survey with each employee. The manager's results are discussed with the employee immediately, but no later than within one month of receiving the results.

5. If the person indicated is the head of the department/department/laboratory, the interview is conducted by the Vice-Dean.

6. The head prepares a protocol in which he or she places the grades received by the teacher and the names of the courses, the students' comments, the explanations of the lecturer, his recommendations for the lecturer and a proposal for further actions.

7. The protocol shall be drawn up. after a conversation between the head of the department/department/laboratory and the person conducting the classes indicated by the Vice-Dean for Education and Student Affairs and the Chairman of the WZdsJK

8. The minutes shall contain the date of the interview as well as the signature of the head and the person conducting the class with whom the head of the class has had a conversation with an annotation that the content of the protocol has been familiarized. The protocol in the form described above shall also be provided by the head of the organisational unit, respectively.

9. The prepared protocol is submitted to the Vice-Dean for Education and Student Affairs, while a copy of it is given to the lecturer and his/her direct superior.

10. The Vice-Rector for Education and Student Affairs shall familiarize himself with the grades obtained by the heads of organisational units and deans. In the event of unsatisfactory grades or critical remarks regarding the conduct of classes, the student is obliged to conduct an explanatory interview, from which a protocol is drawn up as in paragraph 6.

11. The Vice-Dean for Education and Student Affairs is obliged to submit the results of the survey of persons conducting classes and employed in other units to the Vice-Dean for Education and Student Affairs of the home faculty/organisational unit – the home unit conducting the classes.

12. The results of the evaluation of classes at the faculty/organisational unit should be disseminated at the beginning of the next semester, at a meeting of the faculty college, a meeting of the unit, a meeting with employees and students of the faculty. When disseminating information, personal data protection regulations should be taken into account.

13. The results of the student/doctoral student survey should be made available to the Director of the Doctoral School/Head of Doctoral Studies.

14. The chairmen of the programme councils of the fields of study have access to the opinions and average grades of the persons conducting classes in a given field. The results are made available by the Vice-Dean for Education and Student Affairs or the Chairman of the WZdsJK.

15. The Chairman of the WZdsJK, on the basis of the analysis of the results of the survey research or the head of the organisational unit, shall present a report on the course of the evaluation of teaching classes at the meeting of the faculty collegium or the meeting of the unit, respectively, by 15 April and 31 October in a given academic year.

16. The information contained in the results of the evaluation of classes conducted at the Bydgoszcz University of Technology is considered to be relevant when the number of persons who have filled in the assessment form is not less than 30% of the personnel of the surveyed class group.

17. In the event that the number of persons who have completed the assessment form is less than 30% of the staff of the surveyed class group and all or the vast majority of the assessments are negative, the decision to conduct an explanatory interview is made by the Vice-Dean for Education and Student Affairs or the head of the organisational unit.

### Confidentiality and archiving of study documentation

**§ 8.** 1. All documents from the conducted questionnaire evaluation of the education process are confidential and are stored for a period of 4 years in the unit conducting the research, and then archived in accordance with the office instruction introduced by a separate order.

2. All persons participating in the procedure of evaluation of teaching activities and having access to documents from the evaluation of teaching activities are obliged to maintain confidentiality, in particular to maintain the secrecy of information related to these activities (including personal data). You may not use such information for any other purpose.

3. Personal data contained in the survey evaluation protocols are protected on the basis of Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (GDPR).

4. In accordance with Article 100 § 2 point 4 of the Labour Code of the Act of 26 June 1974 (Journal of Laws of 2020, item 1320, of 2021, item 1162), the employee is obliged, in particular, to take care of the welfare of the workplace, protect its property and keep secret information the disclosure of which could expose the employer to damage.

Attachments:

Appendix no. 1 Questionnaire for the evaluation of didactic classes conducted at the Jan and Jędrzej Śniadecki University of Technology in Bydgoszcz

Appendix no. 2 Synthesis of the evaluation of didactic classes conducted at the Jan and Jędrzej Śniadecki University of Technology in Bydgoszcz

**QUESTIONNAIRE FOR THE EVALUATION OF DIDACTIC CLASSES CONDUCTED AT THE JAN AND JĘDRZEJ ŚNIADECKI UNIVERSITY OF TECHNOLOGY IN BYDGOSZCZ**

**Basic information**

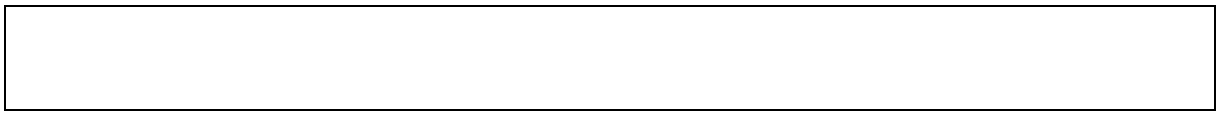
1. Lecturers .....
2. Item Name .....
3. Form of classes: lecture, auditorium exercises; laboratory; project; diploma seminar; field exercises *(appropriate mark)*
4. Field of study/ scientific discipline/ name of postgraduate studies/name of the training course *(appropriate to mark)* .....
5. Academic year .....
6. Year of study ..... Semester .....
7. Form of study (full-time/part-time studies) .....
8. Level of study - first-cycle studies (bachelor's/engineer)/second-cycle studies (master's)/third-cycle studies (doctoral school, doctoral studies)/postgraduate studies/advanced training course – *appropriate circle*

**Please evaluate the classes** (2 – means the lowest grade, 5 – means the highest grade)

| Evaluation criteria | Rating (2-5) |
|---|---|
| Regularity of classes and duration of classes in accordance with the study program | |
| The method of knowledge transfer and preparation of the instructor to conduct classes | |
| Teacher's attitude towards students | |
| Student assessment according to the criteria given | |
| Compliance of the subject matter with the syllabus | |
| Possibility of consulting with the teacher, assistance in understanding the subject of the subject, obtaining answers to questions asked | |

**Strengths and weaknesses of the classes** *(up to 3000 characters)*

| |
|---|
| |



Bydgoszcz University of Technology

Jan and Jędrzej Śniadecki

Version: I.2022

# OBSERVATIONS OF DIDACTIC CLASSES

## PROCEDURE

### Goal of the procedure

**§ 1.** 1. The procedure of observation of teaching classes, hereinafter referred to as the "Procedure", is an element of the management of the process of substantive supervision and assessment of the fulfilment of teaching duties by persons conducting classes at the Jan and Jędrzej Śniadecki University of Technology in Bydgoszcz.

2. The activities carried out as part of the procedure are aimed at verifying and improving the didactic skills of the lecturers, assessing the quality of the education process, and also have an impact on the periodic evaluation of academic teachers.

### Dictionary

**§ 2.** The terms used in the Procedure mean:

1) Observation – observation of the methods of didactic work used by persons conducting classes at the Bydgoszcz University of Technology (academic teachers and other persons participating in education) by authorized persons, in order to assess the quality of the classes conducted.
2) Observer – a person conducting teaching classes with students, students of postgraduate studies or further education courses, regardless of the form of employment.
3) Observation person – the direct superior of the person being observed.
4) Direct Supervisor:
   (a) at the faculty, it is the head of the department/department/laboratory,
   (b) in an organisational unit (Foreign Language Centre, Physical Education and Sport Centre) it is the head and deputy head of the organisational unit,
   (c) in a doctoral school, it is the director of the doctoral school,
   (d) in relation to deans and heads of organisational units, it is the Vice-Rector for Education and Student Affairs,
   (e) in relation to the Vice-Deans for Education and Student Affairs, it is the Dean,

(f) in relation to the heads of departments/departments, it is the Vice-Dean for Education and Student Affairs;

5) Maintaining the rules of confidentiality – proceedings meaning that the results of observation concerning the person conducting the observed classes are not made public. The results of the observation are known to the person being observed, the person observing the observation, the Dean, the Vice-Dean for Education and Student Affairs and the Chairman of the Faculty Team for the Quality of Education;

6) Organisational unit – an organisational unit other than the faculty at which teaching classes are conducted, i.e. the Doctoral School, the Foreign Language Study and the Physical Education and Sport School, unless otherwise stipulated in the provision.

**Scope of the procedure**

**§ 3.** 1. All persons conducting didactic classes with students, students of postgraduate studies and further education courses at all levels and forms of education are subject to observation.

2. The procedure describes the methodology of conducting observations, as well as the method of collecting and processing information about the observations carried out.

**Competence and responsibility**

**§ 4.** Persons responsible for the activities covered by the procedure:

1) the Chairman of the Faculty Team for the Quality of Education (WZdsJK) is responsible for:
   (a) preparing, in consultation with the Vice-Dean for Education and Student Affairs, schedules of observation classes for a given academic year,
   (b) preparation of reports on the performance of observations,
   (c) presenting and discussing the results of observations at a meeting of the faculty college;

2)The Vice-Dean for Education and Student Affairs is responsible for:
   (a) approving the observation schedule prepared by the chairman of the WZdsJK,
   (b) conducting observation of classes conducted by employees from outside the faculty or appointing a person conducting observation from the group of direct superiors (does not apply to observation of classes conducted by employees of organizational units),
   (c) supervising the implementation of observations at the faculty,

(d) discussing the results of observation with the chairman of the WZdsJK,

(e) storage of observation protocols;

3) The head of an organisational unit (SWFiS and SJO) is responsible for:

(a) preparing schedules for observation of classes conducted by the unit's employees,

(b) conducting observation of classes conducted by the unit's employees, in accordance with the schedule,

(c) presenting the results of observations at the meeting of the board of the unit and the Vice-Rector for Education and Student Affairs,

(d) preparing reports on the conducted observations divided into faculties where the observed persons conducted classes and submitting them to the Vice-Dean for Education and Student Affairs of the relevant faculty,

(e) storage of observation protocols;

4) The head of the doctoral school is responsible for:

(a) conducting observations of classes conducted by the staff of the doctoral school in accordance with the schedule,

(b) presenting the results of observations at the meeting of the unit council and the Vice-Rector for Science and Evaluation,

(c) preparing reports on observations,

(d) providing copies of observation protocols to the Vice-Deans for Education and Student Affairs/heads of units in which the observed persons are employed,

(e) storage of observation protocols;

5)The Vice-Rector for Education and Student Affairs is responsible for:

(a) approving schedules for observation classes conducted by employees of organizational units,

(b) preparing schedules for observation of classes conducted by deans of faculties and heads of organizational units,

(c) conducting observations of didactic classes conducted by deans and heads of organizational units, in accordance with the schedule,

(d) presenting to the Rector reports on the course of observation of classes conducted by deans and heads of organizational units,

(e) storage of observation protocols,

(f) handing over copies of observation protocols to the Vice-Deans for Education and Student Affairs/heads of units in which the observed persons are employed;

6) The head of postgraduate studies/advanced training courses is responsible for:
   (a) preparing and submitting observation schedules to the Vice-Dean for Education and Student Affairs/Head of an Organisational Unit,
   (b) conducting at least one observation of classes in each semester of a given edition,
   (c) submitting observation protocols to the Vice-Dean for Education and Student Affairs/Head of an Organisational Unit;
7) Persons performing observations are responsible for:
   (a) conducting observations according to the schedule,
   (b) preparation of observation protocols,
   (c) discussing the content of the protocols with the persons under observation with the indication of recommendations for them,
   (d) submitting protocols to the Vice-Dean for Education and Student Affairs in the case of observation carried out at the Faculty.

**Procedure**

**§ 5.** 1. Observations are planned or interventional.

2. Observation takes place unannounced, on any date of the class.

3. Each person conducting classes at the Bydgoszcz University of Technology should undergo an observation procedure at least once every 2 years, while the classes observed in subsequent years should take various forms.

4. Newly hired persons are subject to mandatory observation in the first year of employment.

5. Teaching observations are carried out in the winter and summer semesters.

6. At the beginning of each semester, the Chairperson of the WZdsJK/head of the organisational unit prepares the observation schedule in accordance with Appendix No. 1 and submits it to the Vice-Dean for Education and Student Affairs/Vice-Rector for Education and Student Affairs for approval on the following dates:

1) to 31 October – for the winter semester;
2) Do 15 Marca – at Semestr Letni.

7. The Vice-Rector for Education and Student Affairs shall prepare a schedule for the observation of deans and heads of organisational units within the deadlines referred to in paragraph 6.

8. In the event that the postgraduate studies/in-service course is not conducted by a faculty/organisational unit, the Vice-Rector for Education and Student Affairs shall appoint a person from among the group of direct superiors who will conduct observation of classes in postgraduate studies or a postgraduate course.

9. The Vice-Dean for Education and Student Affairs/Vice-Rector for Education and Student Affairs may change the schedule of observations.

10. Intervention observations are managed by the Dean of the Faculty/Vice-Dean for Education and Student Affairs/Head of an Organisational Unit/Director of the Doctoral School and the Vice-Rector for Education and Student Affairs upon a written request:

1) submitted to the Dean/Vice-Dean for Education and Student Affairs/Head of an Organisational Unit/Director of a Doctoral School/Vice-Rector for Education and Student Affairs through the Faculty or University Council of Student Self-Government/Doctoral Students;
2) conducting classes;
3) postgraduate students/participants of further training courses;
4) the head of the department/department/laboratory in which the academic teacher is employed.

11. Observations are also carried out in the case of an unsatisfactory assessment of the teacher's didactic work resulting from the survey. The decision in this regard is made by the dean of the faculty/head of an organisational unit/director of the doctoral school/vice-rector for education and student affairs within the scope of his/her competence.

**Conducting observations**

**§ 6.** 1. The Chairman of the WZdsJK, after drawing up and approving the observation schedule, shall forward it to the immediate superiors of the persons subject to the observation procedure.

2. The immediate supervisor informs the person under observation about his or her inclusion in the observation schedule for a given semester.

3. Before conducting the observation, the observer is obliged to familiarize himself with the syllabus of the classes that he will observe.

4. The observer may not interfere in the course of didactic classes.

5. The observer is obliged to discuss the content of the protocol with the observer within 2 weeks from the date of the observation. The person under observation reads the protocol, may also make comments to the protocol, which is confirmed by a signature.

6. In the case of an observation in a department/department/laboratory, the observation protocol according to the template specified in Appendix 2 to the Procedure is submitted to the Vice-Dean for Education and Student Affairs.

7. In the event that the observer is employed at a faculty/organisational unit other than the faculty at which the observed classes are carried out, a copy of the protocol shall be forwarded to the Vice-Dean for Education and Student Affairs of the home faculty of the person under observation or the head of the organisational unit in which the observed person is employed.

8. The observee has the right to appeal against the results of the observation to the dean or rector (in the case of deans and heads of organizational units) within 7 days from the date of reading the minutes.

9. Employees of organisational units have the right to file an appeal to the Vice-Rector for Education and Student Affairs within 7 days from the date of reading the minutes.

10. In the cases referred to in paragraphs 8 and 9, the Dean/Rector/Vice-Rector for Education and Student Affairs may order a committee observation. The committee consists of the current observer and a person appointed by the Dean/Rector/Vice-Rector for Education and Student Affairs.

11. A protocol is drawn up from the observations carried out by the commission and from intervention observations according to the same principles as the protocol from planned observations.

**Analysis of observation results**

**§ 7.** 1. The Chairman of the WZdsJK, immediately after conducting all the observations planned in the organisational unit, is obliged to prepare a report on the observations of classes conducted at the faculty, in accordance with Appendix No. 3, and submit it to the Vice-Dean for Education and Student Affairs.

2. The Vice-Rector for Education and Student Affairs is obliged to submit a report on the conducted observations to the Rector immediately after all planned observations of deans and heads of organisational units in a given semester/year have been conducted. The report is prepared according to the template specified in Appendix No. 3 to the Procedure.

3. The Vice-Rector for Education and Student Affairs shall forward copies of the observation protocols to the Vice-Dean for Education and Student Affairs/Head of the organisational unit in which the employee observed by the Vice-Rector for Education and Student Affairs is employed.

4. The head of an organisational unit, immediately after carrying out all planned observations of the unit's employees, is obliged to prepare a report on the observations carried out and submit it to the Vice-Rector for Education and Student Affairs. The report is prepared according to the template specified in Appendix No. 3 to the Procedure.

5. The head of the organisational unit also prepares a report on the observations carried out for the faculties and submits it to the relevant Vice-Dean for Education and Student Affairs.

6. The head of a doctoral school, immediately after conducting all scheduled observations in the unit, is obliged to prepare a report on the conducted observations of classes and submit it to the Vice-Rector for Science and Evaluation. The report is prepared according to the template specified in Appendix No. 3 to the Procedure.

7. Copies of observation protocols are also submitted to the Vice-Dean for Education and Student Affairs of the relevant faculty.

8. The head of postgraduate studies/advanced training courses, immediately after all scheduled observations, is obliged to prepare a report on the observation of classes and submit it to the relevant Vice-Dean for Education and Student Affairs/Head of the organizational unit. The report is prepared according to the template specified in Appendix No. 3 to the Procedure.

9. If the observer obtains a negative assessment, the observation is carried out again within 6 months of receiving the negative assessment.

10. On the basis of the report prepared in point 1, the Chairman of the WZdsJK presents the conclusions of the observation for each field of study/postgraduate studies/advanced training courses at the last meeting of the faculty college in a given academic year (or at the meeting of the faculty college devoted to the quality of education).

11. The head of the organisational unit shall present a report on the course of the observation at the last meeting of the board of the unit in a given academic year.

12. The observer is obliged to take into account the conclusions from the observation in the planning and conduct of didactic classes.

13. The immediate supervisor is obliged to take into account the conclusions from the observation in the periodic evaluation of employees, promotion policy and in the staffing of classes.

**Final information**

**§ 8.** 1. All persons participating in the procedure of observation of teaching classes and having access to documents from the observation are obliged to maintain the principles of confidentiality, in particular to maintain the secrecy of information related to these activities (including personal data). You may not use such information for any other purpose.

2. Personal data contained in observation protocols are protected on the basis of Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive *95/46/EC* (GDPR).

3. The results of observations and observation protocols are stored, in compliance with the provisions on personal data protection, for a period of 4 years in the dean's office of the unit in which the person conducting the teaching classes is employed or in the secretariat of the head of the organisational unit, the vice-rector for education and student affairs, and then archived in accordance with the Uniform Material List of Files.

4. In accordance with Article 100 § 2 point 4 of the Labour Code of the Act of 26 June 1974 (Journal of Laws of 2020, item 1320, of 2021, item 1162 and of 2022, item 655), the employee is obliged, in particular, to take care of the welfare of the workplace, protect its property and keep secret information the disclosure of which could expose the employer to damage.

Attachments:

*Appendix no. 1 Schedule of teaching observation*

*Appendix no. 2 Protocol of observation of didactic classes*

*Appendix no. 3 Report on the performance of the observation of didactic classes*

**PROTOCOL FROM THE OBSERVATION OF DIDACTIC CLASSES**

**AT THE JAN AND JĘDRZEJ ŚNIADECKI BYDGOSZCZ UNIVERSITY OF TECHNOLOGY**

| | |
|---|---|
| Date of observation: | |
| Lecturer:<br>(name and surname, academic title/degree) | |
| Observer:<br>(name and surname, academic title/degree) | |
| Academic year: | |
| Semester:<br>(winter or summer/semester number in the course of study) | |
| Form of study:<br>(full-time/part-time) | |
| Level of education:<br>(I/II/doctoral school/postgraduate studies/training course) | |
| Field and profile of studies/scientific discipline/name of postgraduate studies/name of the training course: | |
| Item Name: | |
| Personnel status of the group: | |
| Present at the classes: | |
| Form of classes:<br>(lecture, auditorium exercises, laboratory exercises, language course, seminar, field activities) | |
| Place of classes:<br>(building/room/remote – IT platform) | |
| Subject of the classes: | |
| Comments on the conditions of conducting classes independent of the academic teacher's didactic workshop<br>(e.g. size of the room, lighting, thermal comfort, etc.) | |

| **EVALUATION OF OBSERVED CLASSES** |
|---|
| **Is the lecturer:** |

| | |
|---|---|
| **1) was prepared for their conduct, and the content provided was consistent with the content contained in the syllabus in relation to a given form of classes** | |
| Grade (2 - 5, where: 2 – unsatisfactory, 5 – very good): | |
| Justification for the assessment (required): | |
| **2) use appropriate materials and teaching aids in accordance with the form of classes** | |
| Grade (2 - 5, where: 2 – unsatisfactory, 5 – very good): | |
| Justification for the assessment (required): | |
| **3) was tactful and kind to students in class** | |
| Grade (2 - 5, where: 2 – unsatisfactory, 5 – very good): | |
| Justification for the assessment (required): | |
| **4) activated students to work in classes** | |
| Grade (2 - 5, where: 2 – unsatisfactory, 5 – very good): | |
| Justification for the assessment (required): | |
| **5) was open to suggestions from students** | |
| Grade (2 - 5, where: 2 – unsatisfactory, 5 – very good): | |
| Justification for the assessment (required): | |
| **6) used correct language, spoke loudly and clearly** | |
| Grade (2 - 5, where: 2 – unsatisfactory, 5 – very good): | |
| Justification for the assessment (required): | |
| | |
| **Arithmetic mean from partial grades** (points 1 to 6): | |
| | |

| | |
|---|---|
| **Final grade (in words, according to the average of partial grades):** | |
| | |
| **Conclusions and recommendations of the observer:** | |
| | |
| **Date and signature of the observer:** | |
| | |
| **I have accepted without comments/I submit the following comments*:** | |
| | |
| **Date and signature of the observe:** | |

**appropriate to mark*

The principle of issuing the final grade on the basis of the arithmetic mean of partial grades:

- from 4.76 very good (5.0);
- from 4.26 a good plus (4.5);
- from 3.76 good (4.0);
- from 3.26 sufficient plus (3.5);
- from 3.00 sufficient (3.0);
- below 3.00 insufficient (2.0).

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# CRITERION 2

# Method of verification of learning outcomes for qualifications at level 8 of the PRK

## Additional procedures pro-quality system of the Doctoral school

# PHD STUDENT SATISFACTION QUESTIONNAIRE
# BYDGOSZCZ UNIVERSITY OF SCIENCE AND TECHNOLOGY

| | |
|---|---|
| Discipline: | |
| Individual course of education | Yes/No |
| Participation in a research project | Project name |

How do you assess the areas of the university's activities? (2 – means the lowest grade, 5 – means the highest grade)

| AREAS OF EVALUATION OF THE UNIVERSITY | RATING(range 2 to 5) |
|---|---|
| I. UNIVERSITY | |
| Transparency, usefulness and timeliness of information posted on social media and university websites | |
| Functionality and efficiency of the USOSweb/Mobile USOS PBŚ/APD system | |
| Availability, facilities and comfort of places to relax between classes | |
| Availability of parking spaces | |
| Cleanliness and availability of sanitary facilities | |
| Development of the area around the university, e.g. greenery, pavements, rest areas | |
| Access and connection quality for EDUROAM wireless network users | |
| Adapting the university to the needs of people with disabilities | |
| Flow of information between the university and the doctoral student | |
| Availability of a buffet for PhD students | |
| Cloakroom availability | |
| II. DOCTORAL SCHOOL | |
| Marking of classrooms and teaching rooms | |
| Classroom equipment adequate to the classes | |
| Aesthetics, functionality and cleanliness of classrooms | |
| Clarity, completeness and timeliness of information posted on social media and on the university's website – the doctoral school tab and on the internal channel for doctoral students in TEAMS | |
| Organization and schedule of classes | |
| Availability of curricula on the university's website – doctoral school tab (study plan, syllabi, learning outcomes) | |
| Flow of information between the doctoral school and the doctoral student | |
| Opportunity to develop your own interests | |
| Adaptation of the doctoral school to the needs of people with disabilities | |
| Availability of lecturers and supervisors for doctoral students outside of classes | |
| III. DOCTORAL SCHOOL OFFICE | |
| Availability of the Doctoral School office for doctoral students (opening hours and days) | |
| Availability of the school principal for doctoral students | |
| Help in solving problems during education | |
| Reliability of the information provided | |
| Timeliness of processing doctoral cases | |
| Courtesy and kindness | |

| | | |
|---|---|---|
| Information flow between the office and the PhD student | | |
| IV. MAIN LIBRARY | | |
| Offer of printed resources (books / periodicals) – timeliness, number of copies, usefulness | | |
| Offer of electronic resources (databases / e-books / e-journals) – timeliness, completeness, usefulness | | |
| Access to literature indicated by lecturers or listed in the syllabus | | |
| Ease of access to online resources | | |
| Clarity, relevance, completeness and timeliness of information on the library's website | | |
| Library availability (opening hours) | | |
| Library equipment (availability and quality of equipment, signage) | | |
| Competences of library employees | | |
| Culture of service, friendliness, help, availability | | |
| V. STUDENT DORMITORIES (if using tick the appropriate box) | DS-F1 | |
| | DS-F2 | |
| Standard of room and sanitary facilities | | |
| Standard equipment for the kitchen, laundry, bicycle room, stroller room | | |
| Security level | | |
| Adequacy of living conditions to the level of the fee | | |
| Culture of service, friendliness, help, availability | | |
| Landscaping | | |
| Internet access | | |
| Infrastructure around dormitories | | |
| ROOM FOR YOUR OPINION TO THE ABOVE AREAS OF UNIVERSITY EVALUATION (up to 3000 characters) | | |
| | | |

# QUESTIONNAIRE OF SATISFACTION SURVEY OF GRADUATES OF THE DOCTORAL SCHOOL OF THE BYDGOSZCZ UNIVERSITY OF SCIENCE AND TECHNOLOGY

| | |
|---|---|
| Discipline: | |
| Individual course of education | Yes/No |
| Participation in a research project | Project name |

| **How do you evaluate education at the Doctoral School at the Bydgoszcz University of Technology based on the following criteria?**<br>*(2 – means the lowest grade, 5 – means the highest grade)* | **Rating (2-5)** |
|---|---|
| **I. ASSESSMENT OF SELECTED AREAS OF THE UNIVERSITY'S FUNCTIONING** | |
| Office | |
| Library | |
| Careers Office | |
| Teaching infrastructure | |
| Scholarship benefit system | |
| Information systems (USOSweb, APD, ...) | |
| **II. DISTINGUISHING FEATURES OF EDUCATION AT THE DOCTORAL SCHOOL** | |
| How well your expectations are met for the sport you have chosen | |
| Degree of preparation for scientific work | |
| Degree of preparation for teaching work | |
| Prestige of the graduate on the labour market | |
| Level of education | |
| Knowledge/skills/competences acquired during education are an asset in career development | |
| **III. THE DOCTORAL SCHOOL ALLOWED TO OBTAIN:** | |
| Expertise | |
| Practical skills | |
| Knowledge of foreign languages, including industry-specific vocabulary | |
| Ability to use: specialized computer programs/devices/systems/ | |
| Teamwork skills | |
| Interpersonal communication skills | |
| Creative problem-solving skills | |
| **IV. OPEN-ENDED QUESTIONS – DESCRIPTIVE FIELDS UP TO 3000 CHARACTERS:** | |
| *What do you think was the most valuable and innovative during your education at the doctoral school?* | |

| |
|---|
| *What do you think should definitely be changed at the doctoral school?* |
| *What do you think should be improved in the functioning of the doctoral school?* |
| *What do you think should be changed in the curriculum and the ways of verifying learning outcomes?* |

**tick the appropriate*

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# CRITERION 2

# Method of verification of learning outcomes for qualifications at level 8 of the PRK

## Reports on the quality of education at the Doctoral school

Bydgoszcz, 19-11-2020

# Report on the quality of education at the Doctoral School for the academic year 2019-2020

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Dariusz Skibicki

Maria Siwek-Gapińska

## 1. Average Rating Analysis

Table 1 shows the average grades obtained by doctoral students of the first call for 1 year in the academic year 2019-2020. From the analysis *Table 1* It shows that in the summer semester doctoral students received worse grades on average than in the winter semester. In addition, PhD students with the best and worst grades can be indicated.

*Table 1. Average grades of doctoral students I call 2019-2020, year 1*

| PhD student | winter | summer | Average |
|---|---|---|---|
| | 4.1 | 3.6 | 3.9 |
| | 4.7 | 3.5 | 4.1 |
| | 4.8 | 3.7 | 4.3 |
| | 4.2 | 4.7 | 4.4 |
| | 4.8 | 3.9 | 4.4 |
| | 4.6 | 4.1 | 4.4 |
| | 4.3 | 4.7 | 4.4 |
| | 4.7 | 4.1 | 4.4 |
| | 4.6 | 4.3 | 4.5 |
| | 4.8 | 4.1 | 4.5 |
| | 4.8 | 4.1 | 4.5 |
| | 4.9 | 4.3 | 4.6 |
| | 4.8 | 4.4 | 4.6 |
| | 4.6 | 4.9 | 4.7 |
| | 4.8 | 4.6 | 4.7 |
| | 4.8 | 4.7 | 4.8 |
| **Average in semester and year** | **4.64** | **4.22** | **4.45** |

Table 2 presents the average grades for courses carried out in the 1st year. From the analysis *Table 2* it also shows that the grades obtained by doctoral students are weaker in the second semester. It is noteworthy that the grades for the subject Methodology and Planning of Research have deteriorated. The reason for this may be a change of hosts.

*Table 2. Grade point average*

| Average of ratings | Semester | | |
|---|---|---|---|
| Item | winter | summer | Average |
| Data analysis - statistics, data visualization | | 4.0 | 4.0 |
| English in Learning | 4.1 | 4.6 | 4.3 |
| research methodology and planning | 4.8 | 3.9 | 4.4 |

| | | | |
|---|---|---|---|
| Numerical methods | 4.4 | | 4.4 |
| Philosophy of cognition | 4.6 | | 4.6 |
| Grant Essentials | | 4.6 | 4.6 |
| Doctoral seminar | 5.0 | 4.1 | 4.6 |
| rhetoric | 4.9 | | 4.9 |
| **Average for Item** | **4.6** | **4.2** | **4.4** |

## 2. Deletion

*Table 3. List of deletions*

| PhD student | Semester | Cause |
|---|---|---|
| | II | lack of an Individual Research Program |
| | II | two unsatisfactory grades at the end of the first year of education |

## 3. Survey analysis

*Table 4. Anonymous Class Evaluation Questionnaires*

| **Semester I**<br>**Item** | **Number of surveys** | **Average** |
|---|---|---|
| | 1 | 5,0 |
| | 1 | 3,6 |
| | 1 | 5,0 |
| | 1 | 5,0 |
| | 1 | 5,0 |
| | 1 | 3,6 |
| | | |
| **Semester II**<br>**Item** | **Number of surveys** | **Average** |
| | 5 | 4,0 |
| | 3 | 4,93 |
| | 3 | 4,47 |
| | 4 | 5,0 |
| | 2 | 5,0 |
| | 2 | 5,0 |

The analysis of Table 4 shows that in semester II the number of class evaluation questionnaires increased slightly. The involvement of PhD students in the anonymous evaluation of classes is still low. In the vast majority of surveys, only the score for individual questions was indicated, but there are no justifications. Argumentation explaining an existing problem in a given area is especially needed in the case of lower grades.

The two humanities subjects taught in semester I were rated the worst. It should be taken into account that the anonymous questionnaire for these subjects was completed by only one person. Low grades in Philosophy of Cognition and Rhetoric classes do not correlate with the grades obtained by PhD students.

Explanatory interviews were conducted with teachers conducting classes, especially those whose classes were rated lower by PhD students. The problems reported in anonymous surveys have been clarified.

In summary, the importance of anonymous classroom evaluation questionnaires in the system of improving the quality of education should be emphasized. On the other hand, their impact depends on the number of completed questionnaires and the specific justifications contained in them.

## 4. Applications

The amount of data does not yet allow conclusions to be drawn as to the quality of education.

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Bydgoszcz 18 listopada 2025

# Report on the quality of education at the Doctoral School for the academic year 2020-2021

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Dariusz Skibicki
Maria Siwek-Gapińska

## Average Rating Analysis

Table 1 shows the average grades obtained by doctoral students of the first call for 1 year in the academic year 2019-2020.

From the analysis *Table 1* It follows that the grades obtained by doctoral students are in the range of good and very good. The average grades from year to year do not show major deviations.

From the analysis *Table 2* It follows that the grades obtained by doctoral students are in the range of good and very good. The aggregate average for the first semester is identical to that of doctoral students of the first call.

*Table 1. Average grades of doctoral students - I recruitment*

| PhD student | 2019-2020 | | Average | 2020-2021 | | Average |
|---|---|---|---|---|---|---|
| | winter | summer | | winter | summer | |
| | 4.7 | 3.5 | 4.7 | 4.1 | 4.5 | 4.3 |
| | 4.9 | 4.3 | 4.9 | 4.5 | 5.0 | 4.8 |
| | 4.1 | 3.6 | 4.1 | 4.0 | | 4.0 |
| | 4.2 | 4.7 | 4.2 | 4.8 | 4.8 | 4.8 |
| | 4.6 | 4.3 | 4.6 | 4.5 | 4.4 | 4.5 |
| | 4.8 | 4.7 | 4.8 | 4.9 | 5.0 | 5.0 |
| | 4.8 | 3.9 | 4.8 | 4.2 | 5.0 | 4.6 |
| | 4.6 | 4.1 | 4.6 | 4.4 | 4.8 | 4.6 |
| | 4.3 | 4.7 | 4.3 | | | |
| | 4.6 | 4.9 | 4.6 | 4.7 | | 4.7 |
| | 4.8 | 4.1 | 4.8 | 4.3 | 4.9 | 4.6 |
| | 4.8 | 4.6 | 4.8 | 4.7 | 5.0 | 4.9 |
| | 4.7 | 4.1 | 4.7 | 4.4 | 4.7 | 4.5 |
| | 4.8 | 4.1 | 4.8 | 4.5 | 4.9 | 4.7 |
| | 4.8 | 4.4 | 4.8 | 4.8 | 4.8 | 4.8 |
| | 4.8 | 3.7 | 4.8 | | | |
| Average in semester and year | 4.6 | 4.2 | 4.6 | 4.5 | 4.8 | 4.7 |

*Table 2. Average grades of doctoral students - II call*

| PhD student | 2020-2021 | | Average |
|---|---|---|---|
| | winter | summer | |
| | 5.0 | 5.0 | 5.0 |
| | 4.3 | 4.1 | 4.2 |
| | 4.8 | 4.6 | 4.7 |
| | 4.5 | 4.3 | 4.4 |
| | 4.9 | 4.8 | 4.9 |

| PhD student | 2020-2021 | | Average |
|---|---|---|---|
| | winter | summer | |
| | 4.4 | 4.3 | 4.4 |
| | 4.3 | 3.9 | 4.1 |
| | 4.8 | 4.4 | 4.6 |
| | 4.8 | 4.6 | 4.7 |
| | 5.0 | | 5.0 |
| | 4.4 | 4.2 | 4.3 |
| | 4.7 | 4.5 | 4.6 |
| | 4.8 | 4.6 | 4.7 |
| | 4.5 | 4.6 | 4.5 |
| | 4.4 | 4.5 | 4.5 |
| | 4.8 | 4.8 | 4.8 |
| | 4.9 | 4.7 | 4.8 |
| | 4.4 | 4.3 | 4.4 |
| | 4.5 | 4.7 | 4.6 |
| | 4.7 | 4.3 | 4.5 |
| | 4.6 | 4.3 | 4.5 |
| | 4.8 | 4.6 | 4.7 |
| | 5.0 | 4.5 | 4.8 |
| Average in semester and year | 4.6 | 4.5 | 4.6 |

In *Table 3* the average grades for the subjects carried out by the I and II call were presented. The grades obtained are in the range of good and very good, and the average grades from year to year do not show major deviations.

*Table 3. Grade point average*

| Item | 2019-2020 | | Average | 2019-2020 | | Average |
|---|---|---|---|---|---|---|
| | summer | winter | | summer | winter | |
| Data analysis - statistics, data visualization | | 4.0 | 4.0 | 4.0 | 4.3 | 4.2 |
| English in Learning | 4.1 | 4.6 | 4.3 | 4.3 | 4.8 | 4.7 |
| Philosophy of cognition | 4.6 | | 4.6 | 4.6 | 5.0 | 4.8 |
| Inventory | | | | | 4.9 | 4.9 |
| research methodology and planning | 4.8 | 3.9 | 4.4 | 4.4 | 4.3 | 4.3 |
| Numerical methods | 4.4 | | 4.4 | 4.4 | 4.5 | 4.5 |
| Grant Essentials | | 4.6 | 4.6 | 4.6 | 4.0 | 4.2 |
| Internship | | | | | 5.0 | 5.0 |
| Academic entrepreneurship | | | | | 4.8 | 4.8 |

| Item | 2019-2020 | | Average | 2019-2020 | | Average |
|---|---|---|---|---|---|---|
| | summer | winter | | summer | winter | |
| preparation of scientific articles and presentations | | | | | 4.5 | 4.5 |
| rhetoric | 4.9 | | 4.9 | 4.9 | 4.6 | 4.7 |
| Doctoral seminar | 5.0 | 4.1 | 4.6 | 4.6 | 4.8 | 4.7 |
| Contemporary trends in the development of science | | | | | 4.5 | 4.5 |
| Average for Item | 4.6 | 4.2 | 4.4 | 4.4 | 4.6 | 4.6 |

## Deletion

*Table 4. List of deletions*

| PhD student | Semester | Reason for deletion |
|---|---|---|
| | IV | at the request of a doctoral student |
| | IV | No passing of 5 subjects |
| | II | at the request of a doctoral student |

## Analysis of surveys conducting classes

The analysis of Table 4 shows that PhD students evaluate the subjects provided for in the curriculum and their lecturers well and very well.

*Table 4. Anonymous Class Evaluation Questionnaires 2020/21 Summer Semester*

| Item code and name | Instructor | Number of Saved | Answered % | Number of comments | Average |
|---|---|---|---|---|---|
| | | 13 | 52.31 | 4 | 4.91 |
| | | 7 | 28.57 | 0 | 4.90 |
| | | 7 | 28.57 | 0 | 5.00 |
| | | 13 | 43.08 | 2 | 4.30 |
| | | 13 | 52.31 | 2 | 4.89 |
| | | 7 | 28.57 | 0 | 5.00 |
| | | 20 | 34.00 | 1 | 4.35 |
| | | 20 | 32.00 | 2 | 4.86 |
| | | 13 | 44.62 | 2 | 4.79 |
| | | 7 | 14.29 | 0 | 5.00 |
| | | 5 | 40.00 | 1 | 4.90 |
| | | 10 | 20.00 | 1 | 5.00 |
| | | 15 | 33.33 | 2 | 5.00 |
| | | 2 | 0.00 | 0 | - |
| | | 2 | 0.00 | 0 | - |
| | | 15 | 20.00 | 1 | 4.47 |

| | | | | |
|---|---|---|---|---|
| | 15 | 33.33 | 1 | 4.40 |
| | 15 | 26.67 | 1 | 4.90 |
| | 15 | 26.67 | 1 | 4.90 |
| | 10 | 30.00 | 0 | 4.80 |
| | 5 | 40.00 | 1 | 5.00 |
| | 15 | 12.00 | 0 | 4.30 |
| | 15 | 6.67 | 0 | 5.00 |
| | 15 | 26.67 | 1 | 4.90 |
| | 15 | 6.67 | 0 | 5.00 |
| | 15 | 6.67 | 0 | 5.00 |
| | 15 | 13.33 | 0 | 3.70 |

## Analysis of questionnaires for doctoral students on cooperation with a supervisor

In the same period, surveys were also conducted among doctoral students on the quality of their cooperation with the supervisor. Information about the regularity of meetings with the supervisor raises concerns. The results were presented at the meeting of the School Council.

*Table 5. Survey results*

| How do you evaluate your cooperation with the supervisor in general? | Do meetings with the supervisor take place regularly? | Does the supervisor provide you with the conditions to carry out the tests? | How do you assess the cooperation with the supervisor on the preparation of the Individual Research Program? | Other insights |
|---|---|---|---|---|
| 3.0 | 2.0 | 4.0 | 3.0 | lack |
| 5.0 | 5.0 | 5.0 | 5.0 | lack |
| 1.0 | 2.0 | 4.0 | 2.0 | The promoters do not know the current regulations, they still operate in the same way as they were under the old rules. |
| 5.0 | 5.0 | 5.0 | 5.0 | I define the cooperation with my Supervisor at a very high level and I am very satisfied with it. |
| 4.0 | 2.0 | 5.0 | 4.0 | lack |
| 5.0 | 5.0 | 4.0 | 5.0 | Supervisors are helpful, they are helpful in asking questions, they are interested in the doctoral student and help if there are difficulties during the writing of the doctoral dissertation. |
| 5.0 | 4.0 | 5.0 | 5.0 | lack |
| 5.0 | 4.0 | 5.0 | 5.0 | lack |

| | | | | |
|---|---|---|---|---|
| 5.0 | 5.0 | 5.0 | 5.0 | I have a very close and good contact with the Promoter, I have absolutely no reservations. |
| 5.0 | 5.0 | 5.0 | 5.0 | lack |
| 5.0 | 2.0 | 5.0 | 4.0 | lack |
| 4.4 | 3.7 | 4.7 | 4.4 | |

## Analysis of surveys for supervisors on cooperation with doctoral students

In the same period, surveys were also conducted among doctoral students on the quality of their cooperation with the supervisor. It is worth noting that supervisors rate the knowledge and skills of doctoral students low.

*Table 6. Survey results*

| How do you assess your cooperation with PhD students in general? | Do PhD students meet your expectations in terms of knowledge and skills? | Are doctoral students adequately involved in the implementation of the dissertation? | Are PhD students independent? | Do doctoral students show a need for regular consultations? | Other insights |
|---|---|---|---|---|---|
| 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | lack |
| 4.0 | 4.0 | 3.0 | 3.0 | 3.0 | lack |
| 3.0 | 3.0 | 3.0 | 2.0 | 5.0 | The implementation of an individual research plan requires piloting by the supervisor at each stage. I do not notice the doctoral student becoming independent, despite two years of cooperation |
| 5.0 | 4.0 | 4.0 | 4.0 | 5.0 | lack |
| 4.0 | 4.0 | 4.0 | 5.0 | 4.0 | lack |

| | | | | | |
|---|---|---|---|---|---|
| 4.0 | 3.0 | 5.0 | 4.0 | 5.0 | PhD students lack soft skills at the beginning: - formal communication techniques (systematized e-mail communication, systematized reports and the ability to prepare a report) - method of presentation: selection of appropriate information for presentation depending on the purpose of the presentation (seminar, report for the supervisor, project meetings); visual form of presentation, maintaining identity with the institution (use of form templates, letterheads, logotypes)- keeping laboratory diaries (precise notes in general)- ability to analyze the topic, search for and select relevant information- formulate thoughts in a scientific way and formulate complex thoughts. It is known that substantive preparation is most often not possible at the time of qualification for the doctoral school and at the early stages of education. On the other hand, the above-mentioned soft skills seem to be an attribute that should be brought by the PhD student to the cooperation, from the very beginning. These skills, to a varying extent, are usually lacking. |
| 4.0 | 3.0 | 3.0 | 3.0 | 1.0 | lack |
| 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | I evaluate the cooperation with my PhD student very well. He is distinguished by his extensive knowledge and skills in the field of research. She is an independent person, extremely involved in the implementation of the dissertation and other scientific activities. We meet regularly for consultations, thanks to which I have the opportunity to constantly check the progress of the doctoral dissertation and its other scientific activities. |
| 5.0 | 4.0 | 5.0 | 4.0 | 4.0 | lack |
| 4.0 | 3.0 | 4.0 | 3.0 | 5.0 | lack |
| 5.0 | 5.0 | 5.0 | 5.0 | 5.0 | lack |
| 5.0 | 4.0 | 5.0 | 5.0 | 4.0 | lack |
| 4.4 | 3.9 | 4.3 | 4.0 | 4.3 | |

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Bydgoszcz, November 22, 2022

# Report on the quality of education provided at the Doctoral School of the University in the academic year 2021-2022


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Dariusz Skibicki
Maria Siwek-Gapińska

# 1. Analysis of average grades of doctoral students obtained in the course of education

The average grades of doctoral students, with the exception of two people, are above the grade of good (*Table 1*,

*Table 2*, *Table 3*). One of the people with an average below a good grade is subject to a deletion procedure.

The average marks for individual calls remain at the same level. These are usually results above the good plus rating. For each recruitment, a general tendency to increase the average grade in subsequent years of education can be observed.

Grade point averages in subjects (*Table 4*) are above the good rating. Tendencies can be observed to increase the average grade in subjects in subsequent years of education.

*Table 1. Average grades of doctoral students - I recruitment*

| Average with rating | | year | | | |
|---|---|---|---|---|---|
| recruitment | index | 2019/2020 | 2020/2021 | 2021/2022 | Average |
| 2019 | 1 | 4.6 | 4.8 | 5.0 | 4.8 |
| | 2 | 3.9 | 4.0 | | 3.9 |
| | 3 | 4.4 | 4.8 | | 4.6 |
| | 4 | 4.5 | 4.5 | 4.9 | 4.6 |
| | 5 | 4.8 | 5.0 | | 4.9 |
| | 6 | 4.4 | 4.6 | 4.9 | 4.6 |
| | 7 | 4.4 | 4.6 | 4.9 | 4.6 |
| | 8 | 4.4 | | | 4.4 |
| | 9 | 4.7 | 4.7 | | 4.7 |
| | 10 | 4.5 | 4.7 | 4.9 | 4.7 |
| | 11 | 4.3 | | | 4.3 |
| | 12 | 4.7 | 4.9 | 5.0 | 4.9 |
| | 13 | 4.4 | 4.5 | 4.9 | 4.6 |
| | 14 | 4.5 | 4.7 | 4.9 | 4.7 |
| | 15 | 4.6 | 4.8 | 4.9 | 4.8 |
| | 16 | 4.1 | 4.3 | | 4.2 |
| **2019 Total** | | **4.4** | **4.7** | **4.9** | **4.6** |

*Table 2. Average grades of doctoral students - II call*

| Average with rating recruitment | index | year 2019/2020 | 2020/2021 | 2021/2022 | Average |
|---|---|---|---|---|---|
| 2020 | 17 | | 4.7 | 4.8 | 4.8 |
| | 18 | | 4.5 | 4.9 | 4.7 |
| | 19 | | 4.5 | 4.8 | 4.6 |
| | 20 | | 4.6 | 4.7 | 4.7 |
| | 21 | | 4.4 | 4.9 | 4.6 |
| | 22 | | 4.8 | 4.9 | 4.9 |
| | 23 | | 4.8 | 4.8 | 4.8 |
| | 24 | | 4.4 | 4.9 | 4.6 |
| | 25 | | 4.5 | 4.9 | 4.7 |
| | 26 | | 4.7 | 5.0 | 4.9 |
| | 27 | | 4.6 | 4.9 | 4.8 |
| | 28 | | 4.3 | 4.6 | 4.5 |
| | 29 | | 5.0 | lack | 5.0 |
| | 30 | | 4.7 | 4.9 | 4.8 |
| | 31 | | 4.6 | 5.0 | 4.8 |
| | 32 | | 4.1 | 4.5 | 4.2 |
| | 33 | | 4.4 | 4.5 | 4.4 |
| | 34 | | 4.9 | 4.9 | 4.9 |
| | 35 | | 4.4 | 4.9 | 4.7 |
| | 36 | | 4.7 | 4.9 | 4.8 |
| | 37 | | 4.2 | 4.8 | 4.5 |
| | 38 | | 4.8 | 4.9 | 4.9 |
| | 39 | | 5.0 | 4.8 | 4.8 |
| **2020 Total** | | | **4.6** | **4.8** | **4.7** |

*Table 3. Average grades of doctoral students - III call*

| Average with rating | year |
|---|---|

| recruitment | index | 2019/2020 | 2020/2021 | 2021/2022 | Average |
|---|---|---|---|---|---|
| 2021 | 40 | | | 4.7 | 4.7 |
| | 41 | | | 4.7 | 4.7 |
| | 42 | | | 4.8 | 4.8 |
| | 43 | | | 4.5 | 4.5 |
| | 44 | | | lack | lack |
| | 45 | | | lack | lack |
| | 46 | | | 4.8 | 4.8 |
| | 47 | | | 4.8 | 4.8 |
| | 48 | | | 4.6 | 4.6 |
| | 49 | | | 4.9 | 4.9 |
| | 51 | | | 4.7 | 4.7 |
| | 52 | | | 4.4 | 4.4 |
| | 53 | | | 4.4 | 4.4 |
| | 54 | | | 4.7 | 4.7 |
| | 56 | | | 4.6 | 4.6 |
| | 57 | | | 3.9 | 3.9 |
| | 58 | | | 4.7 | 4.7 |
| | 59 | | | 4.4 | 4.4 |
| | 60 | | | 4.3 | 4.3 |
| | 61 | | | 5.0 | 5.0 |
| | 62 | | | 4.5 | 4.5 |
| | 64 | | | 4.5 | 4.5 |
| | 50 | | | 4.9 | 4.9 |
| | 63 | | | 4.9 | 4.9 |
| | 66 | | | 4.8 | 4.8 |
| | 67 | | | 4.7 | 4.7 |
| **2021 Total** | | | | **4.6** | **4.6** |

*Table 4. Grade point average*

| **Average with rating** Items | Years 2019/2020 | 2020/2021 | 2021/2022 | Average |
|---|---|---|---|---|
| Data analysis - statistics, data visualization | 4.0 | 4.3 | 4.5 | 4.3 |
| Learning English | 4.3 | 4.8 | 4.7 | 4.7 |
| Ethics in science | | | 5.0 | 5.0 |
| Philosophy of cognition | 4.6 | 5.0 | 5.0 | 4.9 |
| Inventory | | 4.9 | 4.9 | 4.9 |

| | | | | |
|---|---|---|---|---|
| Pedagogical course | | | 4.9 | 4.9 |
| Research methodology and planning | 4.4 | 4.3 | 4.6 | 4.4 |
| Numerical methods | 4.4 | 4.5 | 4.8 | 4.6 |
| Grant Essentials | 4.6 | 4.0 | 3.9 | 4.1 |
| Professional practice | | 5.0 | 5.0 | 5.0 |
| Academic Entrepreneurship | | 4.8 | 4.9 | 4.9 |
| Preparation of scientific articles and presentations | | 4.5 | 4.7 | 4.6 |
| Rhetoric | 4.9 | 4.6 | 4.8 | 4.7 |
| Doctoral seminar | 4.6 | 4.8 | 4.9 | 4.8 |
| Health and Safety Training | lack | lack | lack | lack |
| Contemporary trends in the development of science | | 4.5 | 4.9 | 4.8 |
| **Average** | **4.4** | **4.6** | **4.8** | **4.7** |

## 2. Increase in PhD scholarships

Lists of PhD students who have received increased scholarship amounts for outstanding academic results are presented in Table 5 and Table 6. The increase in the amount of the scholarship is awarded on the basis of § 22 section 2 of the Regulations of the Doctoral School adopted by the resolution of the Senate of the Jan and Jędrzej Śniadecki University of Technology and Life Sciences in Bydgoszcz No. 2/453 of 20.01.2021.

*Table 5. List of PhD students who received an increase in the amount of the scholarship for outstanding results in the third year*

| Lp. | Album number | Average | Increase amount |
|---|---|---|---|
| 1. | | 4,95 | PLN 474.34 |
| 2. | | 4,86 | PLN 474.34/PLN 730.74* |

*for October 2021: PLN 474.34, from November 2021: PLN 730.74.

*Table 6. List of PhD students who received an increase in the amount of the scholarship for outstanding academic results in the second year*

| Lp. | Album number | Average | Increase amount |
|---|---|---|---|
| 1. | | 5,00 | PLN 474.34 |
| 2. | | 4,86 | PLN 474.34 |
| 3. | | 4,82 | PLN 474.34 |
| 4. | | 4,82 | PLN 474.34 |

The increase in the scholarship was granted for the period from 01.10.2021 to 30.09.2022.

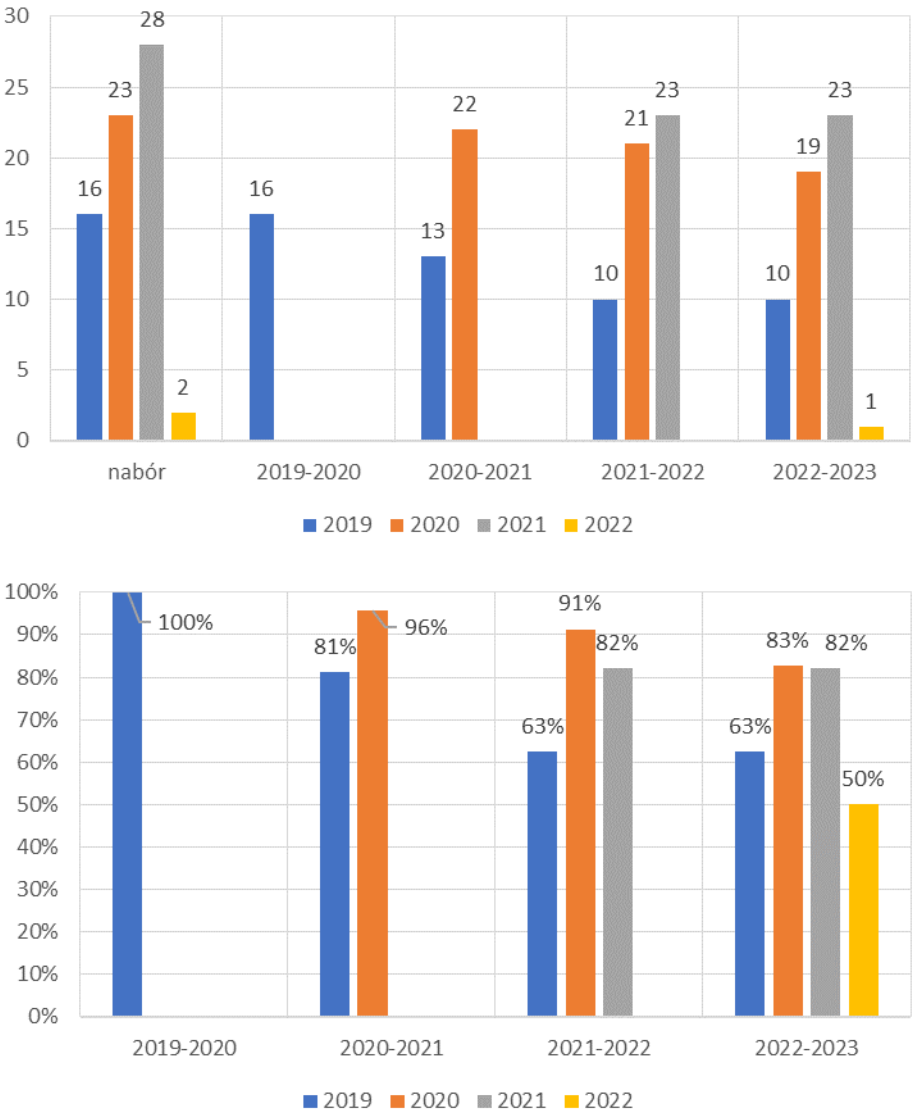
## 3. Deletions from the list of doctoral students

In the academic year in question, 10 doctoral students were crossed out. Failure to pass the semester was the reason for the deletion of 4 doctoral students, resignation from education was also the reason for the deletion of 4 doctoral students, in two cases a doctoral student was removed on the basis of a negative result of the mid-term evaluation.

*Table 7. List of deletions*

| Album number | Discipline | Reason for deletion |
|---|---|---|
| | Mechanical Engineering | failing a semester |
| | Zootechnics and fisheries | negative result of the mid-term evaluation |
| | Mechanical Engineering | negative result of the mid-term evaluation |
| | Mechanical Engineering | Dropping out of education |
| | Mechanical Engineering | failing a semester |
| | Civil Engineering & Transportation | failing a semester |
| | Technical Informatics and Telecommunications | failing a semester |
| | Mechanical Engineering | Dropping out of education |
| | Civil Engineering & Transportation | Dropping out of education |
| | Zootechnics and fisheries | Dropping out of education |

After deletions, the number of doctoral students in individual years of education is presented as in the charts. It should be noted that the number of the first call has dropped to 60%.




Drawing 1. Number of PhD students in the years of education by recruitment

## 4. Analysis of Class Evaluation Questionnaires by PhD Students

The vast majority of lecturers, with the exception of two people, received grades from doctoral students in the range of good to very good grades. All lecturers teaching at the doctoral school were asked to read the questionnaires.

Teachers with grades outside the accepted range of grades, below a good grade, were asked to refer in writing to the grades of doctoral students. Two people gave appropriate explanations. In the case of one lecturer, the lower grade was influenced by the opinions of only two doctoral students. According to the lecturer, the reason for the lower grade could have been the problems of these doctoral students with passing the course. The second lecturer did not agree with the critical assessments presented in the class evaluation questionnaire.

In one case, PhD students submitted comments to a lecturer who shared his or her worldviews. Due to the fact that these were rather unflattering observations, such behavior raises concerns. The lecturer was informed about this. In the next academic year, the questionnaires of doctoral students in relation to the lecturer should be thoroughly analyzed.

The Doctoral School takes steps to activate doctoral students in order to increase the return of class evaluation questionnaires. Lower grades obtained by lecturers often result from the few and negative questionnaires submitted by PhD students. During interviews with PhD students, the management of the Doctoral School emphasizes the essence of questionnaires. Low grades concerned, for m.in, lecturers conducting classes on a limited hourly basis, which could also have had an impact on the result of the evaluation. Therefore, measures have been taken to limit the number of lecturers in favor of the number of teaching hours.

## 5. Observation Analysis

In the academic year 2021/2022, a total of 12 observations were conducted: 3 in the winter semester and 9 in the summer semester. All academic teachers subject to evaluation obtained very good results. The quality opinions formulated in the comments were also very positive. Didactic classes were conducted at a high level. The instructors were distinguished by their extensive experience and competence.

In almost all cases, the conclusions from the observations coincided with the opinions of doctoral students expressed in doctoral surveys.

# 6. Analysis of questionnaires for doctoral students on cooperation with a supervisor

In the academic year 2021/2022, surveys were conducted among doctoral students on the quality of their cooperation with supervisors. The survey included four questions and the opportunity to formulate your own observations. 35% of doctoral students responded positively to the survey.

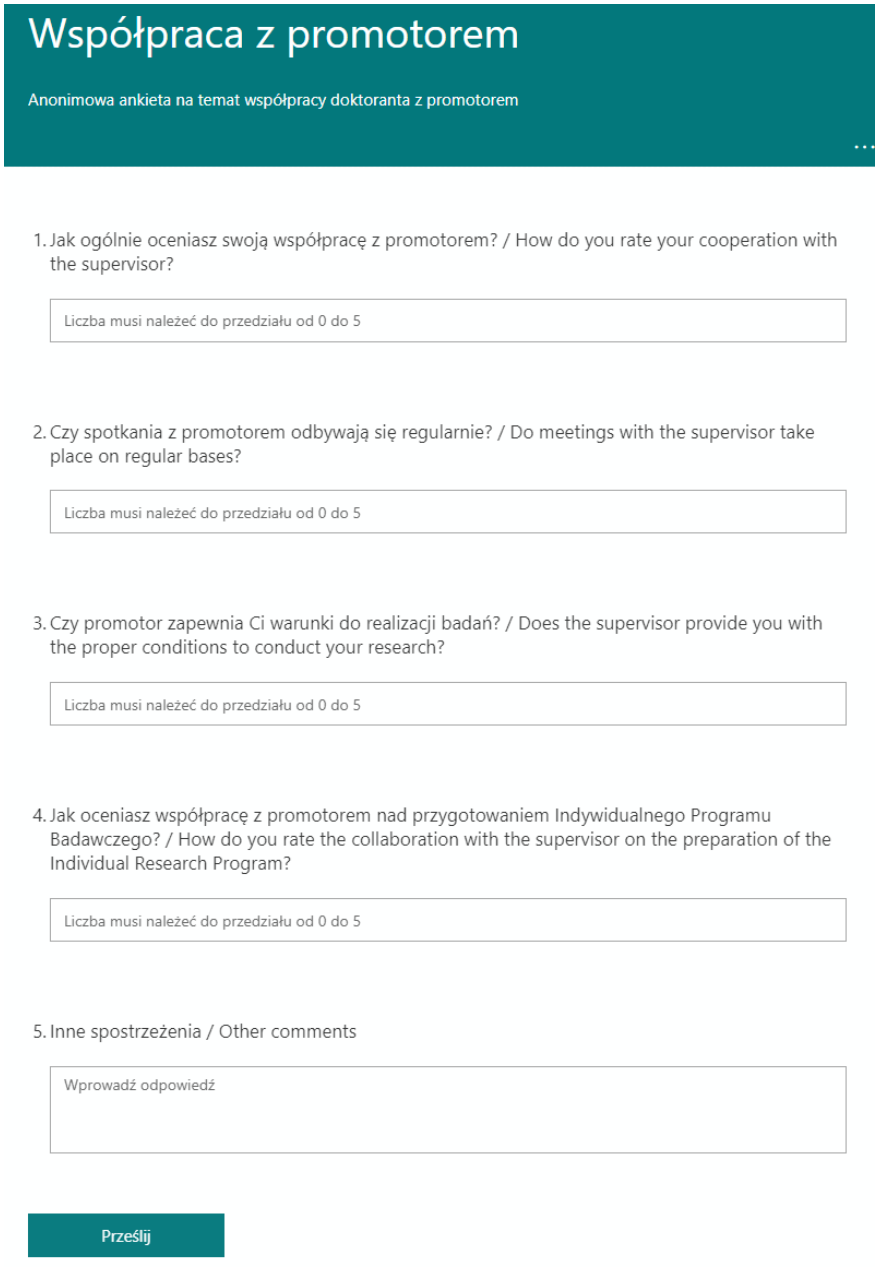



Figure 2. Questionnaire for PhD students

The results are presented in the form of graphs. In the vast majority of doctoral students, they evaluate cooperation with supervisors very well. The opinions formulated by the PhD students were also very flattering. There was only one critical opinion towards the supervisor. It was very general and did not contain any justification.

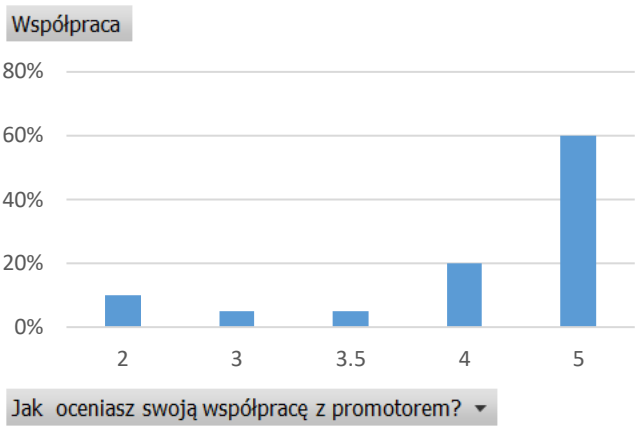



Figure 3. Results for question 1

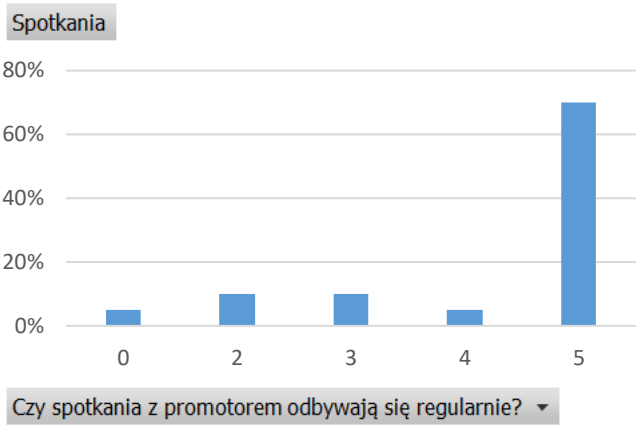



Figure 4. Results for question 2

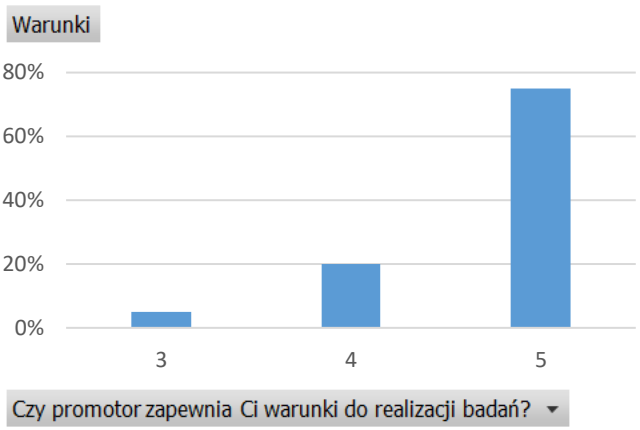



Figure 5. Results for question 3

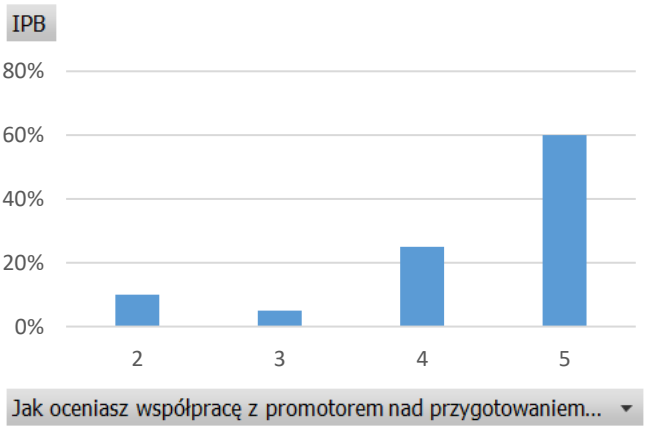



Figure 6. Results for question 4

# 7. Analysis of surveys for supervisors on cooperation with doctoral students

In the academic year 2021/2022, a survey of supervisors' opinions on their assessment of the quality of cooperation with a doctoral student was also conducted. The survey contained five questions and gave the opportunity to formulate their own observations. The survey was completed by 40% of supervisors.

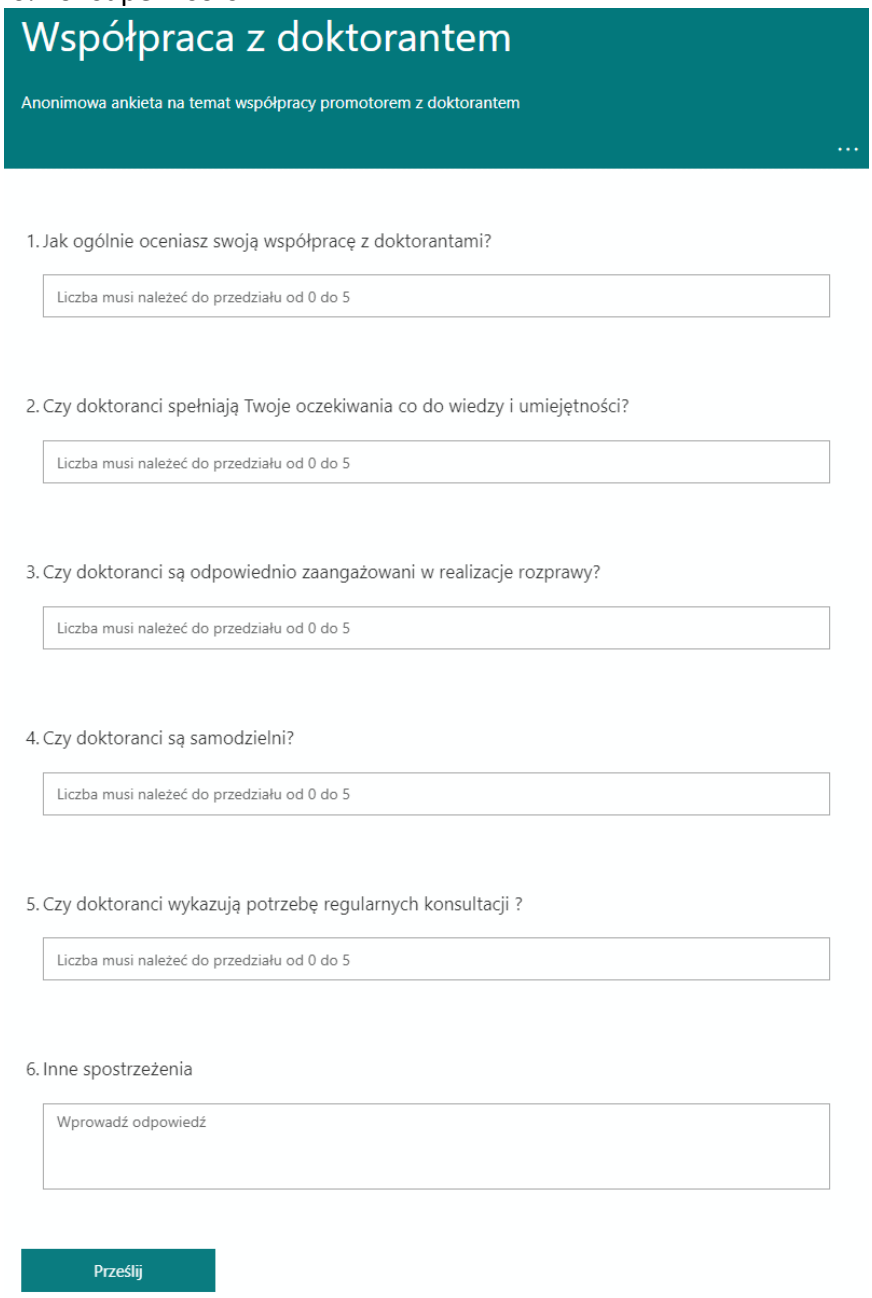



Figure 7. Supervisor Survey

The supervisors evaluate the cooperation with doctoral students well and very well. Only one of the supervisor's opinions was critical of the doctoral student. However, it did not contain any details. One of the promoters suggested a change in the organization of education consisting in the introduction of education for two days, instead of one.

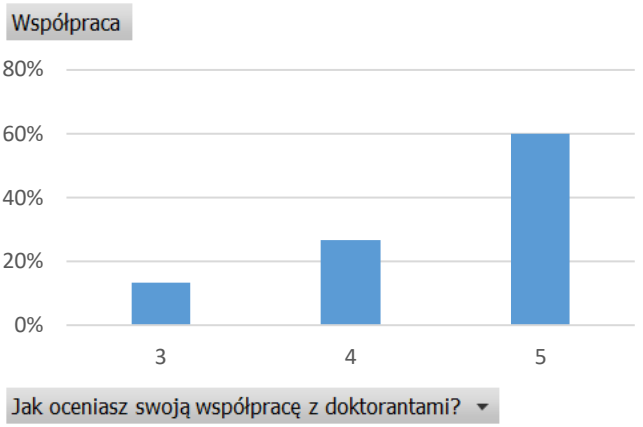



Figure 8. Results for question 1

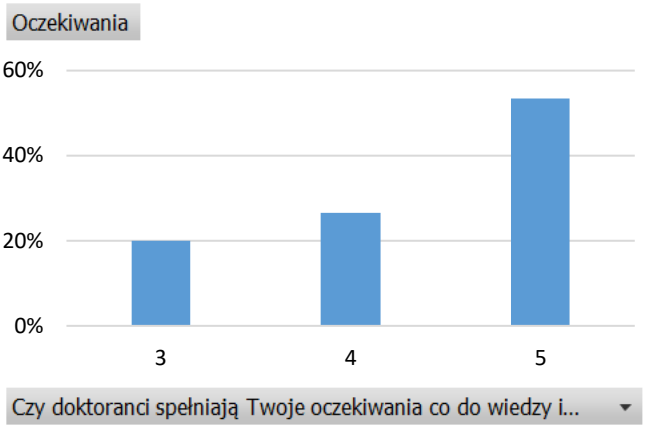



Figure 9. Results for question 2

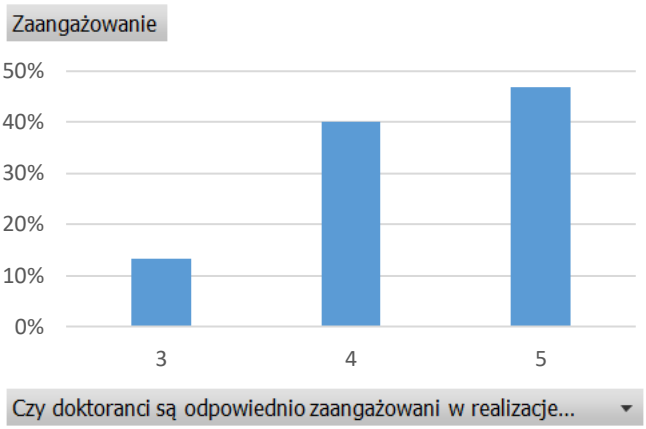


Figure 10. Results for question 3

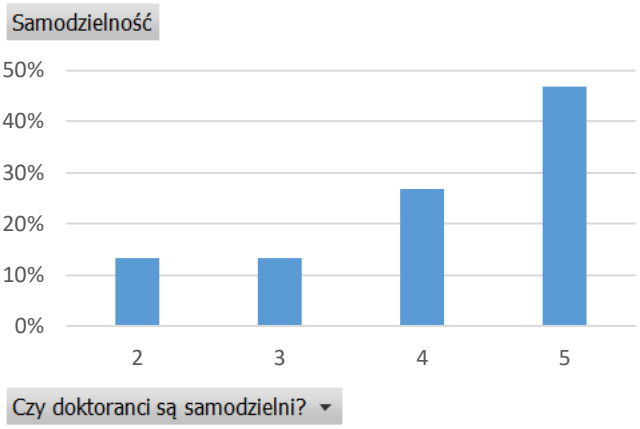



Figure 11. Results for question 4

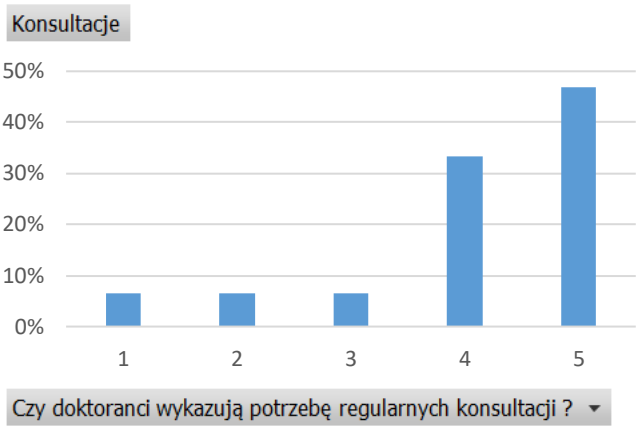



Figure 12. Results for question 5

The management of the Doctoral School will take appropriate actions (individual e-mails addressed to PhD students and supervisors) in order to increase the number of questionnaire returns.

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

Bydgoszcz, 18 January 2024

# Report on the quality of education provided at the Doctoral School of the University in the academic year 2022/2023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Management of the Doctoral School of the University
Dariusz Skibicki
Maria Siwek-Gapińska

# 1. Analysis of doctoral students' grades obtained in the course of education

The grade points of all PhD students are above the good plus grade (table 1). For each year, a tendency to increase the average in subsequent years of education can be observed (by about 0.1). There are no significant differences between the grades between the grades.

*Table 1. Average grades of doctoral students*

| Recruitment | Year of education | | | | |
|---|---|---|---|---|---|
| | 2019/2020 | 2020/2021 | 2021/2022 | 2022/2023 | Average |
| 2019 | 4.4 | 4.7 | 4.9 | 4.9 | 4.6 |
| 2020 | | 4.6 | 4.8 | 5.0 | 4.7 |
| 2021 | | | 4.6 | 4.8 | 4.7 |
| 2022 | | | | 4.7 | 4.7 |

The increase in the average in the following years of education is also visible in the percentage distribution of grades (table 2). With each subsequent year of education, a greater number of higher grades can be observed. When analysing the table, it should be taken into account that the academic year 2019/2020 includes only the first year of 2021, the second year of education 2020/2021 – two years, and the year 2021/2022 – three years. As higher years of education are characterised by a higher average, the years of education cannot be directly compared with each other.

*Table 2. Percentage distributions of the number of ratings*

| Assessment | Year of education | | | |
|---|---|---|---|---|
| | 2019/2020 | 2020/2021 | 2021/2022 | 2022/2023 |
| 3 | 8.1% | 2.5% | 1.0% | 0.9% |
| 3.5 | 9.2% | 4.6% | 2.1% | 0.6% |
| 4 | 13.2% | 14.9% | 11.6% | 6.9% |
| 4.5 | 24.1% | 25.5% | 14.1% | 10.6% |
| 5 | 45.4% | 52.5% | 71.2% | 81.0% |

The average grades obtained by doctoral students for each of the subjects of the curriculum are above the good grade (*table* 3). A tendency to increase average grades in subjects can be observed in subsequent years of education.

*Table* 3. *Grade points average in subjects*

| Items | Year of education | | | | Average |
|---|---|---|---|---|---|
| | 2019/2020 | 2020/2021 | 2021/2022 | 2022/2023 | |
| Data analysis - statistics, data visualization | 4.0 | 4.3 | 4.5 | 4.1 | 4.3 |
| English in Learning | 4.3 | 4.8 | 4.7 | 4.9 | 4.7 |
| Ethics in science | | | 5.0 | 4.8 | 4.9 |
| Philosophy of cognition | 4.6 | 5.0 | 5.0 | | 4.9 |
| Inventory | | 4.9 | 4.9 | 4.8 | 4.9 |
| Pedagogical course | | | 4.9 | 5.0 | 5.0 |
| research methodology and planning | 4.4 | 4.3 | 4.6 | | 4.4 |
| Numerical methods | 4.4 | 4.5 | 4.8 | | 4.6 |
| Grant Essentials | 4.6 | 4.0 | 3.9 | | 4.1 |
| Internship | | 5.0 | 5.0 | 4.9 | 5.0 |
| Academic entrepreneurship | | 4.8 | 4.9 | 5.0 | 4.9 |
| preparation of scientific articles and presentations | | 4.5 | 4.7 | 4.8 | 4.7 |
| rhetoric | 4.9 | 4.6 | 4.8 | | 4.7 |
| Doctoral seminar | 4.6 | 4.8 | 4.9 | 4.9 | 4.8 |
| OHS training | lack | lack | lack | | lack |
| Contemporary trends in the development of science | | 4.5 | 4.9 | 4.9 | 4.8 |

Summary:

1. The high results obtained by doctoral students testify to a good, general level of education.
2. Grade points increase in the following years of education.
3. The averages of the grades of the subjects are similar to each other, which proves their equal level of difficulty.

## 2. Analysis of class evaluation surveys for PhD students

In the academic year 2022/2023, all lecturers were very well evaluated by doctoral students (table 4). The average in the winter semester is 4.87 and in the summer semester 4.96. The lowest grade given by PhD students is 4.38.

From the descriptive parts of the surveys, it can be learned that doctoral students highly value lecturers for their extensive scientific knowledge and professional professionalism. PhD students also evaluate the attitude of lecturers very well, noticing their high personal culture and friendliness towards doctoral students. PhD students are also satisfied with the methods of conducting classes, finding the way they are conducted interesting.

*Table 4. Average survey ratings*

| | Winter semester | Summer semester |
|---|---|---|
| The method of knowledge transfer and preparation of the instructor to conduct classes | 4.92 | 4.98 |
| Compliance of the subject matter with the syllabus | 4.90 | 4.98 |
| Possibility of consultation with the teacher, assistance in understanding the subject of the subject, answers to questions obtained | 4.85 | 4.95 |
| Regularity of classes and duration of classes in accordance with the study program | 4.76 | 4.88 |
| Teacher's attitude towards students | 4.88 | 4.98 |
| Assessing students according to the given | 4.90 | 4.98 |
| **Average** | 4.87 | 4.96 |

The low percentage of completed surveys is a cause for concern. Only 27% of PhD students took part in the survey. Appeals to doctoral students via the TEAMS channel were unsuccessful. In the next evaluation periods, the School management will ask the lecturers for help in encouraging doctoral students to take part in the evaluation of classes.

## 3. Analysis of the results of observation of classes

In the 2022/2023 academic year, a total of 13 observations were carried out: 6 in the winter semester and 7 in the summer semester.

All academic teachers subject to evaluation received very good grades. Didactic classes were conducted at a high level. The instructors were distinguished by their extensive experience and competence. In many cases, the conclusions from the observations coincided with the opinions of doctoral students expressed in doctoral surveys. This proves the good selection of staff in cooperation with the scientific councils of the disciplines.

The conditions for conducting classes also do not raise any doubts. The classrooms are well equipped with teaching aids, provide proper lighting and thermal comfort.

## 4. Analysis of surveys for supervisors on cooperation with PhD students and questionnaires for PhD students on cooperation with supervisors

In the academic year 2022/2023, a survey of supervisors' opinions on their assessment of the quality of cooperation with doctoral students was conducted. The survey contained five questions and gave the opportunity to formulate their own observations. The questionnaire was filled in by 16 supervisors.

On average, the ratings of the supervisors are between 4.0 and 4.2. Unfortunately, the ranges of grades marked on the chart often reach an unsatisfactory grade. Supervisors rate the independence in the scientific work of doctoral students the worst.

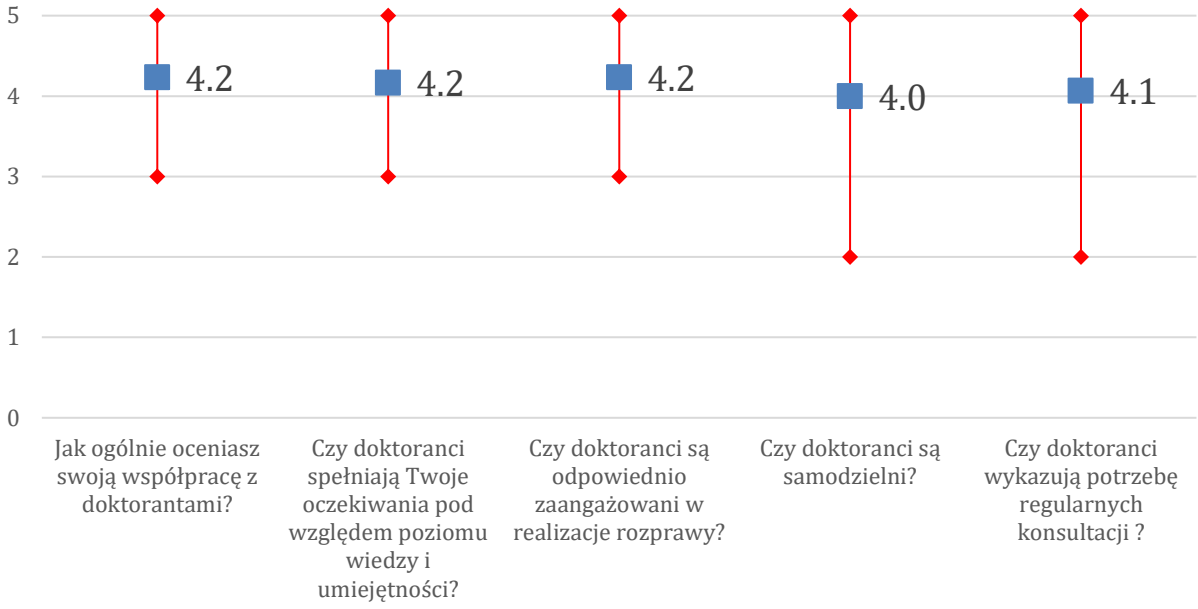


*Figure 1. Results of the survey for promoters*

The descriptive part of the survey also mostly concerns critical remarks in terms of independence. Supervisors also rate the involvement of doctoral students in scientific work low. Here are two quotes from the descriptive section illustrating such opinions:

- "It's a different world than before in terms of commitment, knowledge and independence.",
- "PhD students have a different approach to the education process in S.D. and their involvement in the implementation of the doctoral dissertation."

The lack of involvement of doctoral students in the process of completing the doctoral dissertation was in a way confirmed by their very small participation in the survey for doctoral students on cooperation with supervisors. Only 4 PhD students completed the questionnaires.

The few PhD students who took part in the survey rate the cooperation with their supervisors very well. Their ratings are between 4.5 and 5.0. Based on the high grades, it can be assumed that this is a group of PhD students who are not affected by the critical remarks of their supervisors.

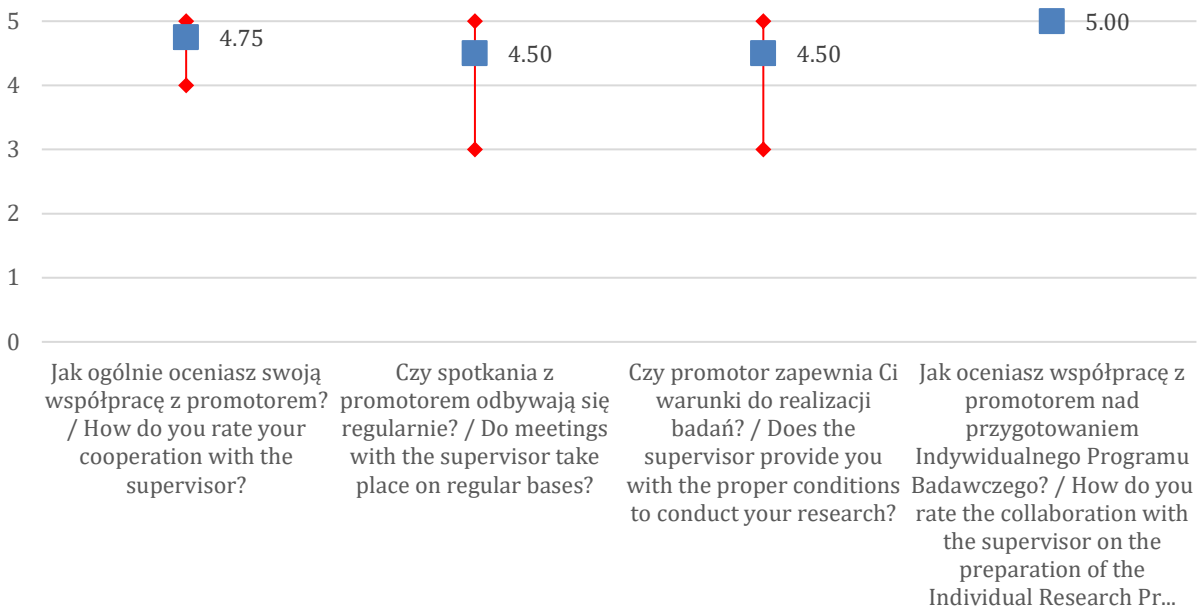


*Figure 2. Results of the survey for doctoral students*

# 5. Internationalization of education

## International projects

The PBŚ Doctoral School carries out activities aimed at increasing the level of internationalization. This year, for the second time, an application was submitted to NAWA for financing the project under the STER program. The application assumed the implementation of the following activities:

a) attracting foreign doctoral students;
b) payment of NAWA scholarships for the best foreign and Polish doctoral students carrying out doctoral projects in international cooperation;
c) support for foreign mobility for the best doctoral students from Polish and abroad;
d) internationalization "in the country".

The NAWA Evaluation Team refused to grant funds for the implementation of this project. The good level of internationalization of the doctoral school and the desire to develop a joint program of education of doctoral students with partners from abroad should be considered a strong point. The moderate impact of this Project on the development of internationalization of education and research at the Doctoral School of the University of Silesia was considered to be a weakness. The draft was considered very conservative, due to the adopted indicators.

## Foreign lecturers

The management of the Doctoral School undertakes activities aimed at making the didactic offer of the Doctoral School more attractive, as well as to familiarize doctoral students with the solutions used by foreign centers aimed at the professional development of young scientists by establishing cooperation with foreign universities, their staff and doctoral students. These activities are manifested, m.in, in the organization of lectures by foreign speakers visiting the University of Technology as part of the ERASMUS+ program.

On 13.06.2023, the PBŚ Doctoral School hosted Dr. Şule Eryürük - KTO Karatay University, Dept. of Industrial Engineering with a lecture on "Multi Criteria Decision Making".

Photo: by Prof. Maria Siwek-Gapińska

Other aspects of internationalization:

- The share of foreign students in Poland is about 15%.
- There is a 10% group of PhD students who have a second PhD supervisor from abroad.

## 6. Pro-quality system

Until the academic year 2022/2023, the increase in the amount of the scholarship was awarded on the basis of § 22 section 2 of the Regulations of the Doctoral School adopted by the resolution of the Senate of the Jan and Jędrzej Śniadecki University of Technology and Life Sciences in Bydgoszcz No. 2/453 of 20.01.2021. In accordance with the Regulations, the Headteacher of the School increases the due doctoral scholarship for 20% of doctoral students from each year by 20% of its value for a period of one year.

In the academic year 2022/2023, 10 scholarships were awarded (table 5). The list of doctoral students who received increased scholarship amounts for outstanding academic results, together with the average grades for their academic results, is presented in the tables: table 6, table 7, table 8. The total sum of the increase in the pro-quality scholarship is about PLN 88 thousand gross.

*Table 5. Incentive allowance in the academic years 2021/2022 and 2022/2023*

| | 2021/2022 | 2022/2023 |
|---|---|---|
| I recruitment | 2 | 2 |
| II call for proposals | 4 | 4 |
| III call for proposals | - | 4 |
| IV call | - | - |
| together | 6 | 10 |

*Table 6. List of PhD students who received an increase in the amount of the scholarship for outstanding academic results in the fourth year*

| Lp. | Album number | Average |
|---|---|---|
| 1. | [redacted] | 5,00 |
| 2. | [redacted] | 5,00 |

*Table 7. List of PhD students who received an increase in the amount of the scholarship for outstanding academic results in the third year*

| Lp. | Album number | Average |
|---|---|---|
| 1. | [redacted] | 5,00 |
| 2. | [redacted] | 4,91 |

| | | |
|---|---|---|
| 3. | [redacted] | 4,91 |
| 4. | | 4,91 |

*Table 8. List of PhD students who received an increase in the amount of the scholarship for outstanding academic results in the second year*

| Lp. | Album number | Average |
|---|---|---|
| 1. | [redacted] | 5,00 |
| 2. | | 4,86 |
| 3. | | 4,83 |
| 4. | | 4,82 |

In the Regulations No. 4, introduced by Resolution No. 14/479 of 22.03.2023, the provision on the obligatory pro-quality scholarship has been removed. The new provision states that the headteacher may increase the scholarship after obtaining the Rector's consent. For the academic year 2023/2024, no increase in the scholarship was awarded.

# 7. Participation of PhD students in the activities of the science division

## Competition "Scientific activities of young people"

PhD students are very eager to take part in the "Scientific Activities of the Young" competition. In 2023, 11 PhD students received funding.

| No | First Name, Last Name | Title |
|---|---|---|
| 1. | | Application for funding for the implementation of a young scientist's project under the "Scientific Activities of the Youth" competition – an open access scientific publication. |
| 2. | | Molecular basis of the gut-brain axis in poultry under the influence of embryonic stimulation of the gut microbiota – preliminary studies |
| 3. | | Fatigue analysis of aluminum alloy with increased strength properties in the - high and gigacycle range |
| 4. | | Assessment of the impact of the degrading environmental factor on changes in the structure and mechanical properties of polymer plastic elements produced by additive techniques. |
| 5. | | Determination of the phenolic profile of grain of primary barley genotypes Hordeum vulgare L. var. nigricans (Ser.) Körn and H. vulgare L. var. rimpaui Wittm grown under conditions of varied nitrogen nutrition. |
| 6. | | Influence of microporous injection moulding process conditions on the properties of polyamide composites filled with glass fibre |
| 7. | | Award of funds under the "Scientific Activities of the Youth" competition for the publication of research results: "Evaluation of chemical and biological properties of tillage eroded Luvisols" |
| 8. | | Mechanical Properties of Carbon Fiber Reinforced Thermoplastic Laminates |
| 9. | | Analysis of Properties of Welded Joints of Steel and Aluminum Alloy Using a Thin-Walled Explosion Welded Fastener During Bending |
| 10. | | Application for funding for the implementation of an open access scientific publication. |
| 11. | | Characteristics of compounds with antioxidant potential in seeds of selected pea varieties grown in Poland |

## Interdisciplinary seminars of PBŚ

Every year, doctoral students of the Doctoral School take an active part in interdisciplinary seminars. During the period covered by the report, the following papers were presented:

26.10.2022

1. Krzysztof Pałczyński - Application of Machine Learning to Support the Process of Acute Lymphoblastic Leukemia Examination

24.05.2023

1. Jarosław Drulik - Artificial Intelligence in CMBD configuration database construction processes
2. Piotr Kanarek - Development of an innovative technology for chlorine-free treatment of rinsing water in the agri-food industry using bioactive ingredients of plant origin
3. Paweł Majkowski - Testing of concrete elements with steel and composite reinforcement of high strength under static and dynamic load
4. Przemysław Stalowski - Selection of crumb pile and the influence on the strength and macrotexture of concrete made in rolling technology
5. Jean de Dieu Muhire - Endophyte eradication technology in the production of symbiotically modified grasses

## 8. Results of the mid-term evaluation

In the table (table 9) provides aggregate information on all mid-term evaluations carried out so far. It is noteworthy that the number of negative ratings is decreasing every year. After taking into account the appeals, 2 negative grades were given for the first year, 1 negative grade for the second, and this year's grade ended without negative grades.

*Table 9. Mid-term evaluation 2021-2023*

| Year of evaluation | number of doctoral students | Number of positive evaluations before/after the appeal | Number of negative reviews before/after the cancellation | Reference |
|---|---|---|---|---|
| 2021 | 11 | 8/9 | 3/2 | 2 |
| 2022 | 20 | 18/19 | 2/1 | 1 |
| 2023 | 20 | 19/20 | 1/0 | 1 |

Table 10 presents detailed data on this year's mid-term evaluation for doctoral students from the 2021 recruitment by discipline. After taking into account one appeal, all doctoral students received positive grades.

*Table 10. Evaluation results for PhD students from the 2021 recruitment by discipline*

| Lp. | Index No. | discipline | assessment |
|---|---|---|---|
| 1 | 58 | Mechanical Engineering | Positive |
| 2 | 61 | Mechanical Engineering | Positive |
| 3 | 59 | Mechanical Engineering | negative / positive after appeal |
| 4 | 62 | Mechanical Engineering | Positive |
| 5 | 49 | Mechanical Engineering | Positive |
| 6 | 60 | Mechanical Engineering | Positive |
| 7 | 42 | Mechanical Engineering | Positive |
| 8 | 56 | Mechanical Engineering | Positive |
| 9 | 64 | Mechanical Engineering | Positive |
| 10 | 48 | Civil engineering, surveying and transport | Positive |
| 11 | 57 | Civil engineering, surveying and transport | Positive |
| 12 | 50 | Zootechnics and fisheries | Positive |
| 13 | 63 | Zootechnics and fisheries | Positive |

| | | | |
|---|---|---|---|
| 14 | 43 | Zootechnics and fisheries | Positive |
| 15 | 66 | Zootechnics and fisheries | Positive |
| 16 | 47 | Agriculture and horticulture | Positive |
| 17 | 51 | Agriculture and horticulture | Positive |
| 18 | 54 | Agriculture and horticulture | Positive |
| 19 | 41 | Agriculture and horticulture | Positive |
| 20 | 52 | Agriculture and horticulture | Positive |

On the basis of the minutes of the Mid-Term Evaluation Committee, it can be stated that the average percentage of doctoral dissertation completion, determined by the members of the Committee, increases from year to year, of which:

- in 2021 it was 41%, including 7 people at the level of 50%;
- in 2022, 51%, including 15 people at the level of 50% and above, the highest result of 70% was achieved by a person conducting a dissertation within the discipline of technical informatics and telecommunications;
- In 2023, 53%, including 17 people at the level of 50% and above, the highest result of 75% was achieved by a person conducting a dissertation within the discipline of zootechnics and fisheries.

## 9. Deletions from the list of doctoral students and the number of doctoral students

In the academic year 2022/2023, 9 doctoral students were crossed out (table 12).

*Table 11. Number of deletions*

| | Academic year | | | | |
|---|---|---|---|---|---|
| **Recruitment** | **2020-2021** | **2021-2022** | **2022-2023** | **2023-2024** | Total |
| 2019 | 3 | 3 | **0** | 1 | 7 |
| 2020 | 1 | 1 | **5** | 0 | 7 |
| 2021 | 0 | 5 | **3** | 0 | 8 |
| 2022 | 0 | 0 | **1** | 0 | 1 |
| Total | 4 | 9 | **9** | 1 | 23 |

Six doctoral students were expelled due to resignation from education. One doctoral student was withdrawn because of a negative mid-term evaluation, one because he did not start his education after a break and one because of unsatisfactory progress in the preparation of his doctoral dissertation (table 12).

*Table 12. List of deletions with reasons for deletion*

| recruitment | Deletion date | Reason for deletion |
|---|---|---|
| 2020 | 2022-11-05 | Dropping out of education |
| 2020 | 2022-12-17 | negative result of the mid-term evaluation |
| 2020 | 2022-10-29 | Dropping out of education |
| 2020 | 2023-01-16 | resignation from education (transfer of the project to the Nicolaus Copernicus University) |
| 2020 | 2023-01-16 | resignation from education (transfer of the project to the Nicolaus Copernicus University) |
| 2021 | 2023-09-30 | failure to take up education after a holiday break |
| 2021 | 2023-06-28 | Dropping out of education |
| 2021 | 2023-09-01 | unsatisfactory progress in the preparation of the doctoral dissertation |
| 2022 | 2022-11-04 | resignation from education (implementation doctorate) |

The case of the doctoral student's deletion due to unsatisfactory progress in the preparation of the doctoral dissertation as a result of his complaint went to the Voivodeship Administrative Court.

In two cases, the resignation of a doctoral student from education preceded the School's decision to delete it due to lack of progress in education.

In the reporting period, the school received a decision of the Provincial Administrative Court rejecting the doctoral student's complaint against the decision to delete it due to failing the semester, issued at the end of the summer semester in the academic year 2021/2022.

After four years of education, 47 doctoral students are currently educated at the PBŚ Doctoral School.

*Table 13. Number of PhD students*

| Discipline | Recruitment | Current state |
|---|---|---|
| Technical Informatics and Telecommunications | 4 | 3 |
| Mechanical Engineering | 28 | 20 |
| Chemical Sciences | 5 | 4 |
| Agriculture and horticulture | 13 | 13 |
| Zootechnics and fisheries | 16 | 4 |
| Civil engineering, surveying and transport | 5 | 3 |
| **Total** | **71** | **47** |

## 10. Completion of education

Out of 8 doctoral students of the first year of 2019, only one person completed their education. The remaining 7 people applied for an extension of the deadline for submitting their doctoral dissertation. All doctoral students have obtained approval. The reasons given by PhD students for the extension are COVID m.in and other circumstances beyond the control of PhD students, such as illnesses, family situations, unforeseen problems in the implementation of research. In the case of one doctoral student, the reason for the extension was the resignation of the supervisor and the need to appoint a new one.

On 16 January 2024, a meeting was organised with the doctoral students who have been granted an extension and with their supervisors to check the progress of the dissertation and motivate the doctoral students to keep the declared new deadline for submitting the dissertation. With regard to 5 PhD students, the state of dissertation preparation is good. The Director decided to initiate proceedings to remove 2 people from the list of doctoral students.

## 11. Applications

1. Taking into account:
   - good and very good grades of doctoral students obtained in the subjects of the curriculum,
   - positive opinions in doctoral surveys on classes, lecturers and educational conditions,
   - positive results of class observation,

It can be said that the implementation of the educational program is proceeding without interruptions.

2. Due to the fact that:
   - all doctoral students obtained a positive result of the mid-term evaluation,
   - all doctoral students receive good grades from the doctoral seminar,
   - the level of involvement of doctoral students in the implementation of the doctoral dissertation is low,
   - the efficiency of education is only 1/8,

the implementation of IPB by PhD students raises reservations.

3. Probable reasons for the low efficiency of education for the first year may be:
   - initially liberal – in relation to subsequent years – recruitment rules,
   - low percentage of progress in the IPB implementation rate, as identified as part of the mid-term evaluation (in 2021 it amounted to 41% on average),
   - insufficient supervision over the implementation of the dissertation as part of doctoral seminars,
   - insufficient sponsor care,
   - lack of sufficient involvement of PhD students in the implementation of IPB (noted in surveys for supervisors),
   - several extensions of the deadline for doctoral defences for doctoral students in expired doctoral studies.

4. The following remedial actions were taken:
   - the recruitment rules have been modified: the minimum number of points for a positive qualification result has been increased, the rules for awarding points for previous scientific activity and for the doctoral student's scientific plans have been changed, points for language certificates and for the declaration of a future supervisor have been abolished,
   - by the decision of the Rector, recruitment was limited to doctoral students pursuing a doctoral dissertation as part of research projects financed from external funds.

- the lecturers of the doctoral seminar were informed about the need to correlate the grade in this subject with the level of advancement of the dissertation,
- the School's website contains information for supervisors and future supervisors about the principles of IPB implementation, to help them supervise doctoral students,
- training for promoters in the field of JSA was organized,
- a meeting with PhD students and supervisors was organized to determine the status of IPB implementation and motivate them to meet the extended deadline for submitting the dissertation.

5. In addition, it is planned to:
   - improving the School's supervision over the implementation of doctoral dissertations by formulating recommendations for the chairs of the Mid-Term Evaluation Committee and lecturers conducting doctoral seminars,
   - organization of information meetings for supervisors of first-year doctoral students,
   - agreeing with the Scientific Councils of the Disciplines on the principles of cooperation in the field of supervision of the implementation of doctoral dissertations,
   - modification of the IPB by introducing a point concerning the analysis of the risk of delaying the completion of the doctoral dissertation and proposing a recovery plan,
   - modification of IPB by introducing a requirement to submit a grant application in the first two years of education,
   - improving cooperation with the University Council of Doctoral Students' Self-Government in order to improve the involvement of doctoral students in the implementation of IPB.

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

October 29, 2024

# Report on the quality of education provided at the Doctoral School of the University in the academic year 2023/2024

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# 1. Analysis of doctoral students' grades obtained in the course of education

The average grades in the subjects in the curriculum of the Doctoral School for all doctoral students are above the grade of good plus (table 1). Between the years, especially the first year (2019 recruitment) and the last one (2023 recruitment), an increase in the average grade can be observed. The average grade of 5.0 for the last call is probably due to the fact that it is conducted exclusively for "project" doctoral students. These doctoral students are usually more motivated to study at the Doctoral School, and the classes are usually individual.

*Table 1. Average grades of doctoral students*

| recruitment | Academic year 2019/2020 | 2020/2021 | 2021/2022 | 2022/2023 | 2023/2024 | Average |
|---|---|---|---|---|---|---|
| 2019 | 4,4 | 4,7 | 4,9 | 4,9 | | 4,6 |
| 2020 | | 4,6 | 4,8 | 5,0 | 4,8 | 4,8 |
| 2021 | | | 4,6 | 4,8 | 4,8 | 4,7 |
| 2022 | | | | 4,7 | 4,8 | 4,8 |
| 2023 | | | | | 5,0 | 5,0 |

The average grades obtained by doctoral students for each of the subjects of the curriculum are above the good grade (table 2). The grades obtained indicate that the level of teaching is sufficiently high in all subjects and balanced between them.

Table 2. Grade points average in subjects

| Items | Years 2019/2020 | 2020/2021 | 2021/2022 | 2022/2023 | 2023/2024 | Average |
|---|---|---|---|---|---|---|
| Data analysis - statistics, data visualization | 4,0 | 4,3 | 4,5 | 4,1 | | 4,3 |
| English in Learning | 4,3 | 4,8 | 4,7 | 4,9 | 5,0 | 4,7 |
| Ethics in science | | | 5,0 | 4,8 | 5,0 | 5,0 |
| Philosophy of cognition | 4,6 | 5,0 | 5,0 | | 4,5 | 4,9 |
| Inventory | | 4,9 | 4,9 | 4,8 | | 4,9 |
| Wind Engineering | | | | | 5,0 | 5,0 |
| Pedagogical course | | | 4,9 | 5,0 | 4,8 | 4,9 |
| research methodology and planning | 4,4 | 4,3 | 4,6 | | | 4,4 |
| Numerical methods | 4,4 | 4,5 | 4,8 | | | 4,6 |
| Grant Essentials | 4,6 | 4,0 | 3,9 | | | 4,1 |
| Internship | | 5,0 | 5,0 | 4,9 | 5,0 | 5,0 |
| Academic entrepreneurship | | 4,8 | 4,9 | 5,0 | 5,0 | 4,9 |

| | | | | | | |
|---|---|---|---|---|---|---|
| preparation of scientific articles and presentations | | 4,5 | 4,7 | 4,8 | 5,0 | 4,7 |
| rhetoric | 4,9 | 4,6 | 4,8 | | 5,0 | 4,7 |
| Doctoral seminar | 4,6 | 4,8 | 4,9 | 4,9 | 4,7 | 4,8 |
| Contemporary trends in the development of science | | 4,5 | 4,9 | 4,9 | 4,8 | 4,8 |
| **Average** | **4,4** | **4,6** | **4,8** | **4,9** | **4,8** | **4,7** |

## Summary

1. The high teaching results obtained by doctoral students testify to a good, general level of education.
2. The averages of the grades of the subjects are similar to each other, which proves their equal level of difficulty.

## 2. Analysis of class evaluation surveys for PhD students

In the academic year 2023/2024, all lecturers were very well evaluated by doctoral students (table 3). The vast majority of PhD students gave very good grades. The descriptive part corresponds to the assessment on a numerical scale. In the statements of doctoral students, there is often praise for the professionalism, knowledge and attitudes of teachers.

As in previous years, the low participation of doctoral students in surveys is a cause for concern. In terms of percentage, in the winter and summer semesters, the questionnaires were completed by 24 and 18% of doctoral students, respectively. The maximum number of people filling out the survey for one subject is 4. However, the rule is for individual people to complete surveys for the subject. Against this background, foreign doctoral students make a positive impression; This group is the most active.

*Table 3. Average survey ratings*

| | Winter semester | Summer semester |
|---|---|---|
| The method of knowledge transfer and preparation of the instructor to conduct classes | 4.96 | 5.00 |
| Compliance of the subject matter with the syllabus | 4.87 | 5.00 |
| Possibility of consultation with the teacher, assistance in understanding the subject of the subject, answers to questions obtained | 4.92 | 4.98 |
| Regularity of classes and duration of classes in accordance with the study program | 4.96 | 4.98 |
| Teacher's attitude towards students | 4.90 | 5.00 |
| Assessing students according to the given | 4.91 | 5.00 |
| Average | 4.92 | 4.99 |

### Summary

As in the previous year, the lecturers of the Doctoral School were highly rated by doctoral students. The low participation of doctoral students in surveys remains a problem. Against the background of the general passivity of doctoral students, foreign students who show greater activity stand out positively.

## 3. Analysis of the results of observation of classes

In the academic year 2023/2024, a total of 4 observations were carried out: 2 in the winter semester and 2 in the summer semester.

The small number of observations is due to two reasons. The first is a collision of classes conducted by the school principal conducting observations and teachers indicated for observation. The second reason is the implementation of classes by doctoral students in the "project" mode of the Individual Course of Education. It results in a reduced number of classes and individual dates for their classes.

All academic teachers whose classes were subject to observation received very good grades. Didactic classes were conducted at a high level. The instructors were distinguished by their extensive experience and competence. In many cases, the conclusions from the observations coincided with the opinions of doctoral students expressed in doctoral surveys.

The conditions for conducting classes also do not raise any doubts. The classrooms are well equipped with teaching aids, provide proper lighting and thermal comfort.

### Summary

Very good results of observation convince of the correct selection of staff for classes conducted at the Doctoral School.

# 4. Analysis of surveys on cooperation between supervisors and doctoral students

The Doctoral School conducts two types of surveys on cooperation between supervisors and doctoral students: surveys for supervisors on cooperation with doctoral students and surveys for doctoral students on cooperation with supervisors.

## Surveys for promoters

In the academic year 2023/2024, the questionnaire was completed by 15 supervisors. For comparison, in the last academic year it was 16 people. In percentage terms, the share of promoters who completed the survey increased from 33% to 39% year on year.

Supervisors' ratings are between 3.9 and 4.4. Unfortunately, the ranges of grades marked on the chart often reach an unsatisfactory grade. This year, it takes place in as many as 3 categories. The need for doctoral students to have regular consultations with the supervisor is rated the worst by supervisors.

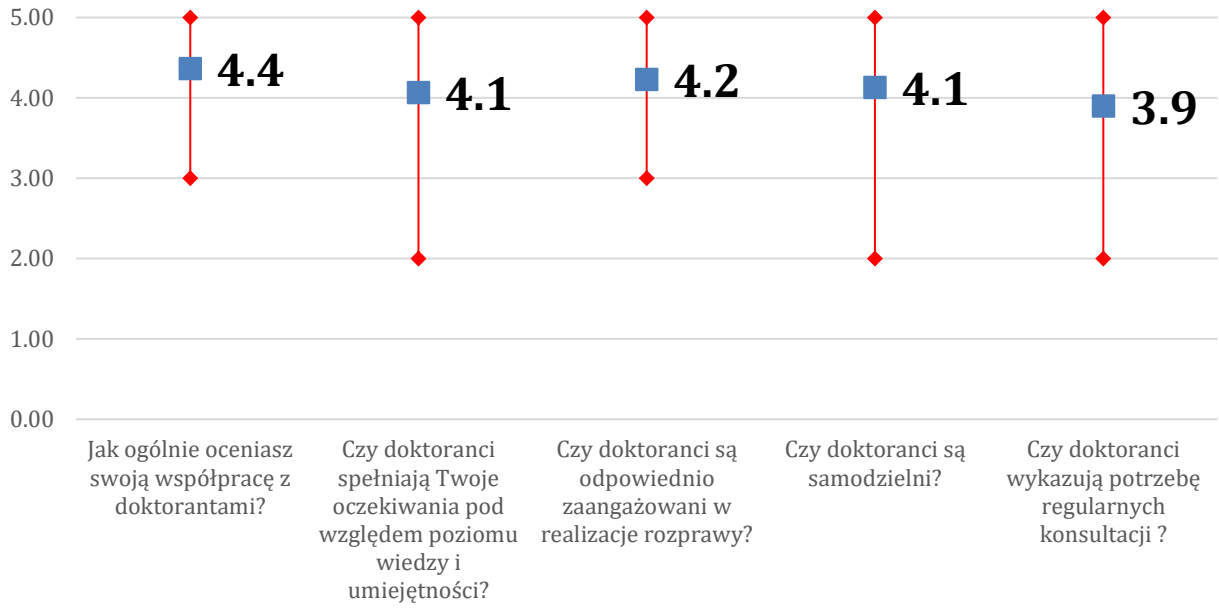


*Figure 1. Results of the survey for promoters*

In the previous academic year, the statements of the supervisors emphasized the low independence of doctoral students. This year, the supervisors did not indicate the lack of independence of doctoral students, which may suggest an improvement in this area. This year's statements of the promoters can be summarized as follows:

- the implementation doctorate requires a lot of commitment and work;
- the process of conducting research is slowed down by delays in the substantive assessment of annual reports by the Ministry;

- the doctoral scholarship is an important factor determining the participation of doctoral students in the Doctoral School;
- PhD students are not very creative and their substantive knowledge is not at a sufficient level;
- More regular presentations of work results could be beneficial for doctoral students.

## Surveys for PhD students

In the reporting period, a very large group of doctoral students took part in the survey. As many as 19 people, compared to 4 in the previous year, should be considered a very good result. A factor that has significantly contributed to such a large improvement in attendance are the joint Doctoral School and the doctoral students' self-government.

The evaluations of cooperation with the supervisor given by doctoral students are very high. The opinions of doctoral students confirmed the grades on a numerical scale. Words of praise and thanks for their work were addressed to the promoters.

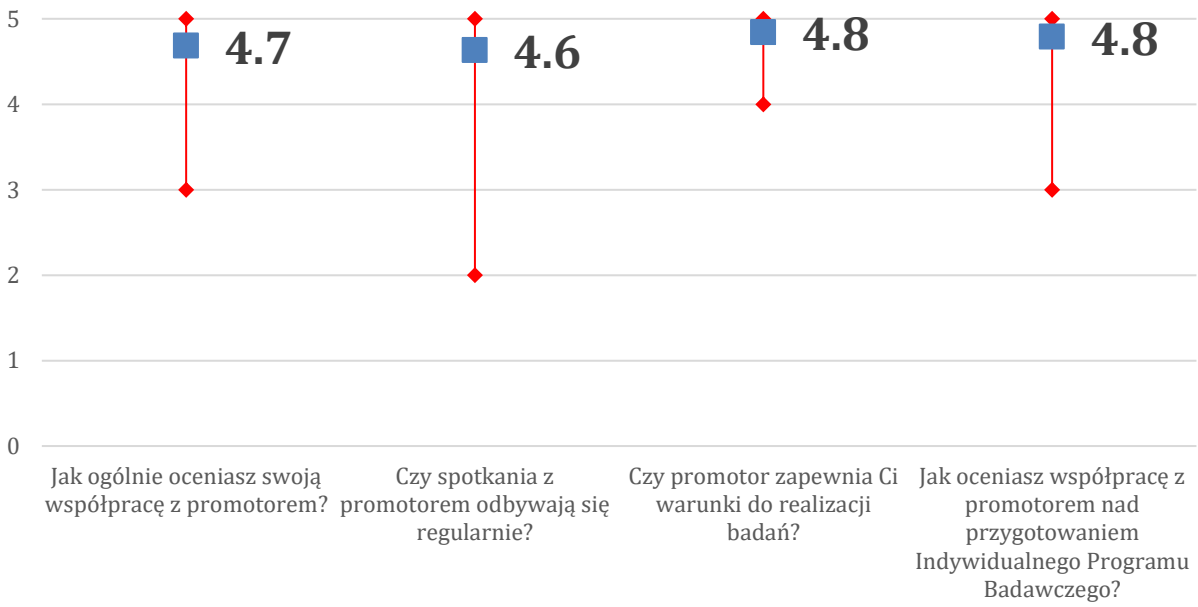


*Figure 2. Results of the survey for doctoral students*

## Summary

The activities of the doctoral students' self-government are very effective, so it is worth expanding them with initiatives encouraging participation in surveys evaluating teaching classes.

# 5. Analysis of doctoral and graduate satisfaction surveys

Satisfaction surveys of doctoral students and graduates consist of numerical assessments of various aspects of the university's activities divided into several categories and a descriptive assessment.

## PhD student surveys – average of numerical grades

The research was conducted for 15 PhD students. In general, the grades of doctoral students are good and very good. The lowest ratings were given by doctoral students to access to parking spaces, a cafeteria, changing rooms and the infrastructure around the dormitories (Table 4 and Table 8). The highest marks were obtained by the office of the doctoral school (Table 6).

*Table 4. Evaluations of PhD students in the University area*

| I. UNIVERSITY | Assessment |
|---|---|
| Transparency, usefulness and timeliness of information posted on social media and university websites | 4,5 |
| Functionality and efficiency of the USOSweb/Mobile USOS PBŚ/APD system | 4,3 |
| Availability, equipment and comfort of places to relax between classes | 4,3 |
| Availability of parking spaces | 4,2 |
| Cleanliness and availability of sanitary facilities | 4,5 |
| Development of the area around the university, e.g. greenery, pavements, rest areas | 4,6 |
| Access and call quality for users of the EDUROAM wireless network | 4,5 |
| Adapting the university to the needs of people with disabilities | 4,4 |
| Flow of information between the university and the doctoral student | 4,8 |
| Availability of the buffet for doctoral students | 4,2 |
| Availability of cloakrooms | 4,1 |

*Table 5. Doctoral student evaluations in the Doctoral School area*

| II. DOCTORAL SCHOOL | Assessment |
|---|---|
| Marking of classrooms and teaching rooms | 4,7 |
| Classroom equipment adequate to the classes | 4,8 |
| Aesthetics, functionality and cleanliness of classrooms | 4,6 |
| Transparency, completeness and timeliness of information posted in social media and on the university's website – the doctoral school tab and on the internal channel for doctoral students in TEAMS | 4,7 |
| Organization and schedule of classes | 4,6 |
| Availability of educational programmes on the university's website – doctoral school tab (study plan, syllabus, learning outcomes) | 4,8 |
| Opportunity to develop your own interests | 4,7 |
| Adaptation of the doctoral school to the needs of people with disabilities | 4,4 |
| Availability of lecturers and supervisors for PhD students outside the classroom | 4,7 |

*Table 6. Evaluations of PhD students in the area of Doctoral School Office*

| III. DOCTORAL SCHOOL OFFICE | Assessment |
|---|---|
| Availability of the doctoral school office for doctoral students (opening hours and days) | 5,0 |
| Availability of the school principal for doctoral students | 5,0 |
| Help with solving problems during education | 5,0 |
| Reliability of the information provided | 5,0 |
| Timeliness of consideration of doctoral cases | 5,0 |
| Kindness and kindness | 5,0 |
| Information flow between the office and the doctoral student | 5,0 |

*Table 7. Evaluations of PhD students in the Main Library area*

| IV. MAIN LIBRARY | Assessment |
|---|---|
| Offer of printed resources (books / magazines) – up-to-dateness, number of copies, usefulness | 4,6 |
| Offer of electronic resources (databases / e-books / e-journals) – up-to-dateness, completeness, usefulness | 4,7 |
| Access to literature indicated by lecturers or listed in the syllabus | 4,7 |
| Clarity, usefulness, completeness and timeliness of the information on the library's website | 4,5 |
| Library availability (opening hours) | 4,7 |
| Library equipment (availability and quality of equipment, signage) | 4,5 |
| Competences of library staff | 4,6 |
| Service culture, kindness, help, availability | 4,8 |

*Table 8. Evaluations of PhD students in the area of Student Dormitories*

| V. STUDENT HOUSES | Assessment |
|---|---|
| Standard of room equipment and sanitary facilities | 4,0 |
| Standard of equipment kitchen, laundry, bicycle room, stroller room | 4,2 |
| Security level | 4,6 |
| Adequacy of living conditions to the level of the fee | 4,2 |
| Service culture, kindness, help, availability | 4,4 |
| Landscaping | 4,2 |
| Internet access | 4,4 |
| Infrastructure around the dormitories | 3,6 |

## PhD student surveys - summary of opinions

The open statements of doctoral students can be summarized in the following 5 categories:

1. Infrastructure and housing conditions
   - Bathrooms – problems with cleanliness and accessibility in building H – the need to modernize and adapt to standards;
   - Classrooms – modernization needed to improve the comfort of learning;

- Parking – insufficient number of spaces and lack of enforcement of the ban on parking in prohibited places;
- Disabled people – lack of proper toilets and accessibility for wheelchair users – adjustments are necessary;

2. Organization of didactic classes
   - Schedule – postponing classes to Mondays or Fridays for greater flexibility;
   - Thematic adaptation – no classes addressed to doctoral students of specific disciplines;

3. IT systems: APD and USOSWEB:
   - APD (Diploma Thesis Archive) – to enable the upload of larger files so that works with numerous figures do not have to be reduced;
   - USOSWEB – the system is too complicated and difficult to use, which makes access difficult for PhD students;

4. Support for International Students:
   - Bureaucracy – too little support in administrative matters, which are particularly important for international doctoral students;

5. Accommodation conditions:
   - Academic house – satisfaction with the staff, but criticism of housing conditions that negatively affect comfort and well-being.

The open statements of doctoral students largely coincide with the numerical assessment. PhD students draw attention to the low availability of parking spaces and the difficult housing conditions of the dormitories. In relation to numerical assessments, new issues also appear. The most important include: the need to move classes to the beginning or end of the week, adapting toilets to the needs of people with disabilities, improving IT systems. Some of the postulates of doctoral students have already been implemented, namely: blocks of elective subjects from each discipline in which education takes place have been introduced and blockades of reserved parking spaces have appeared. Some opinions are divergent from the numerical assessment. We are talking about the evaluation of support in the implementation of bureaucratic procedures for foreign doctoral students. Most likely, the doctoral students had other issues in mind than the work of the doctoral school office itself.

## Alumni surveys – average numerical grades

The worst grade was given by graduates to the work of the career office (Table 9). They also pointed out the insufficient level of their knowledge of professional English vocabulary after completing their education at the Doctoral School (Table 11). I am pleased with the very good evaluation of the work of the doctoral school office (Table 9) and an assessment of the level of knowledge, skills and competences acquired during their education at the Doctoral School (Table 10).

*Table 9. Evaluation of graduates in various areas of the functioning of the University of Technology*

| I. EVALUATION OF SELECTED AREAS OF THE UNIVERSITY'S FUNCTIONING | Assessment |
|---|---|
| Office | 4,9 |
| Library | 4,6 |
| Career Office | 3,3 |
| Teaching infrastructure | 4,0 |
| Scholarship benefits system | 4,7 |
| Information systems (USOSweb,APD, . . .) | 4,1 |

*Table 10. Graduate evaluations in relation to the Doctoral School*

| II. DISTINGUISHING FEATURES OF EDUCATION AT THE DOCTORAL SCHOOL | Assessment |
|---|---|
| The degree to which your expectations related to the chosen discipline are met | 4,2 |
| Degree of preparation for scientific work | 4,6 |
| Degree of preparation for teaching work | 4,1 |
| Graduate's prestige on the labour market | 4,3 |
| Level of education | 4,3 |
| Knowledge/skills/competences acquired during education are an asset in professional career development | 4,7 |

*Table 11. Graduate evaluations in relation to the Doctoral School*

| III. THE DOCTORAL SCHOOL ALLOWED TO OBTAIN: | Assessment |
|---|---|
| Practical skills | 4,1 |
| Knowledge of foreign languages, including industry vocabulary | 3,6 |
| Ability to use: specialized computer programs/devices/systems/ | 4,3 |
| Teamwork skills | 4,0 |
| Interpersonal communication skills | 4,1 |
| Creative problem-solving skills | 4,0 |

## Alumni surveys - summary of opinions

Open statements of graduates can be 4 aspects of the functioning of the university:

1. The most valuable and innovative aspects of education in the doctoral school:
   - diploma seminars preparing for public defence;
   - planning of research tasks and their timely implementation;
   - the fact of the existence of a doctoral school;
   - learning about research methods and approaches to problems in various disciplines;
   - acquiring practical skills, e.g. filing patents and operating research software.

2. What should be changed in the doctoral school:
   - more English classes, especially in article editing;
   - the restoration of remote learning (as during the pandemic);
   - moving classes to a more convenient day (Monday or Friday);
   - reducing the number of less useful items in favor of more practical ones.

3. What can be improved in the functioning of the school:
   - focus on preparing for conference presentations during English classes;
   - more training in teaching skills and career development opportunities;
   - more classes thematically tailored to individual disciplines.

4. Changes in the curriculum and methods of verification:
   - the content of the courses should be better suited to the disciplines of doctoral students;
   - verification of the results should be based more on project tasks than exams;
   - introduction of mandatory consultations with supervisors.

The critical opinion, which is reflected in the low numerical grade, concerns too few English classes. PhD students emphasize the need to improve their public speaking skills and write articles in English. The same applies to the assessment of preparation for teaching work as part of education at the Doctoral School.

## Applications

In general, the grades given by PhD students and graduates of SzD, especially numerical ones, are very high. The comments of doctoral students are valuable. On their basis, the following guidelines can be formulated:

1. Modernization is needed in the field of sanitary facilities, accessibility for the disabled and parking spaces.
2. PhD students postulate that education at the Doctoral School will be transferred to the beginning or end of the week.
3. The need for changes in the English language program is indicated. PhD students postulate more intensive improvement of conference speaking and writing skills.
4. PhD students see the need for changes in the operation of the APD and USOS digital systems.

# 6. Internationalization of education

## International projects

This year, the School did not submit an application to NAWA. The reason is the withdrawal of foreign partners who were supposed to be included in the application. Potential foreign partners set a condition for the possibility of issuing a double doctoral diploma. The university, due to the conservative provisions of the PSWiN in this regard, did not decide on such a possibility.

## Foreign lecturers

In the past academic year, one foreign lecture was organized. On 21.05.2024 The PBŚ Doctoral School hosted Assoc. Prof. Dr. Eyup Calik from the Department of Industrial Engineering, Yalova University with a lecture entitled "Data Mining and An Implementation in HR".

*Figure 3. Meeting participants*

## Other aspects of internationalization

The percentage share of foreign doctoral students and supervisors in the described period of education is:

1. the share of foreign students in Polish is about 18%;
2. There is a 10% group of PhD students who have a second PhD supervisor from abroad.

In the past academic year, a cooperation agreement was signed with Shakarim University of Semey, Republic of Kazakhstan. The parties agreed on the terms of cooperation in the field of education of doctoral students through participation in joint educational programs and peer review of scientific papers. These activities are aimed at raising educational standards and developing international cooperation networks among future researchers.

The university offers the opportunity to participate in the Erasmus+ exchange program, which allows doctoral students to educate and implement IPB in other countries. Nevertheless, in the last academic year, only 1 PhD student decided to submit an application and leave.

The university provides access to global sources of knowledge. Through the Main Library, it invests in libraries, databases and remote access to licensed electronic resources so that, for m.in, doctoral students can benefit from international publications and research results.

# 7. Participation of PhD students in the activities of the science division

## Competition "Scientific activities of young people"

PhD students are very eager to take part in the competition organized by the Vice-Rector for Science and Evaluation entitled "Scientific activities of young people". In 2024, six doctoral students received funding under this project, for a total of PLN 79,417.30. In total, since 2022, in three consecutive editions of the competition, 27 doctoral students of the Doctoral School have received funding in the amount of PLN 321,276.41.

*Table 12. Grants awarded to doctoral students in the academic year 2023-2024 under the "Youth Scientific Activities" program*

| Discipline | Grant No. | Title | Amount |
|---|---|---|---|
| Mechanical Engineering | RNCB.503.2.2024 | Assessment of the influence of environmental factors on changes in the structure and mechanical properties of polymer plastic elements produced by additive techniques | 15000.00 |
| Agriculture and horticulture | RNCB.503.3.2024 | Evaluation of the effect of natural plant extracts in reducing pathogens isolated from agri-food industry washwater | 14931.46 |
| Chemical Sciences | RNCB.503.12.2024 | Production and characterization of modern hybrid polyvinyl chloride composites with wood flour and haloisite | 7627.00 |
| Mechanical Engineering | RNCB.503.18.2024 | Monitoring of the fracture process and visual analysis of fatigue breaks of engineering materials operating in the gigacyl fatigue range | 15000.00 |
| Agriculture and horticulture | RNCB.503.19.2024 | Response of photosynthetic efficiency parameters and leaf area index of alternative barley genotypes to increasing sowing density | 14400.00 |
| Zootechnics and fisheries | RNCB.503.25.2024 | participation in an international conference organized by the European Federation of Animal Science | 12458.84 |
| | | Amount: | 79417.30 |

## Interdisciplinary seminars of PBŚ

Every year, doctoral students of the Doctoral School take an active part in the Interdisciplinary Seminars of the Bydgoszcz University of Technology. During the period covered by the report, 9 papers were presented at two seminars. The topics of the speeches are listed in the following table.

*Table 13. Presentations of PhD students delivered as part of the PBŚ Interdisciplinary Seminars in the academic year 2023-2024*

| Discipline | PhD student | Presentation title |
|---|---|---|
| Mechanical Engineering | | The impact of optimization of post-production processes on the quality and biocompatibility of 3D printed implants |
| Mechanical Engineering | | Carbon fabric reinforced thermoplastic composites made by pressing technique |
| Mechanical Engineering | | Method of precise setting of the offset parameter in the process of friction welding with mixing of different materials |
| Mechanical Engineering | | Verification of selected hypotheses of accumulation of fatigue damage in the high- and gigacycle range |
| Mechanical Engineering | | Method of testing the resistance to cracking and the influence of process parameters on the mechanical properties of the FSW S355/AA6061-T6 butt joint |
| Zootechnics and fisheries | | Gut-hepatic axis response to gut microbiota modification by in ovo stimulation in broilers. |
| Agriculture and horticulture | | Fawn soils – origins, properties and significance in Polish agriculture |
| Zootechnics and fisheries | | Effects of prebiotic and probiotic administered in-ovo on hatchability, chick quality, productive performance, cecal histomorphology, carcass and meat quality traits of broiler chickens |
| Zootechnics and fisheries | | Probiotics or Prophybiotics? Validation of effects of *in-ovo* administration on gut health and production of broiler chickens |

## 8. Mid-term evaluation

In the table (table 14) provides aggregate information on all mid-term evaluations carried out so far. It is noteworthy that the number of negative ratings is decreasing every year. After taking into account the appeals, 2 negative grades were given for the first year, 1 negative grade for the second, and this year's grade ended without negative grades.

*Table 14. Mid-term evaluation 2021-2023*

| Year of evaluation | number of doctoral students | number of positive reviews before cancellation | Reference | Appeals Accepted | Number of positive reviews after cancellation |
|---|---|---|---|---|---|
| 2021 | 11 | 8 | 3 | 1 | 9 |
| 2022 | 20 | 18 | 2 | 1 | 19 |
| 2023 | 20 | 19 | 1 | 1 | 20 |
| 2024 | 2 | 2 | 0 | 0 | 2 |

Table 15 presents detailed data on this year's mid-term evaluation for doctoral students from the 2022 recruitment by discipline. All doctoral students received positive grades.

*Table 15. Results of the mid-term evaluation in 2024*

| Lp. | discipline | assessment |
|---|---|---|
| 1 | Civil Engineering, Surveying & Transportation | Positive |
| 2 | Technical Informatics and Telecommunications | Positive |

On the basis of the minutes of the Mid-Term Evaluation Committee, it can be stated that the average percentage of doctoral dissertation completion, determined by the members of the Committee, increases from year to year, of which:

- in 2021 it was 41%, including 7 people at the level of 50%;
- in 2022, 51%, including 15 people at the level of 50% and above, the highest result of 70% was achieved by a person conducting a dissertation within the discipline of technical informatics and telecommunications;
- in 2023, 53%, including 17 people at the level of 50% and above, the highest result of 75% was achieved by a person conducting a dissertation within the discipline of zootechnics and fisheries,
- In 2024, it averaged 65%, of which 80% in the discipline of civil engineering, surveying and transport and 50% in the discipline of technical informatics and telecommunications.

# 9. Completion of education

## Extension of education

At the end of the academic year 2023/2024, after the consent of the Rector's Office, 8 doctoral students received an extension of the deadline for submitting their dissertation.

In accordance with the remedial actions planned last year, meetings with doctoral students and supervisors were organized, the lecturers of the doctoral seminar were informed about the need to correlate the grade in this subject with the level of advancement of the dissertation, and information for supervisors and future supervisors about the principles of IPB implementation was published on the School's website. As you can see, these corrective actions did not turn out to be effective.

It should be borne in mind that some remedial measures, such as limiting the recruitment to doctoral students pursuing their doctoral dissertation as part of externally funded research projects, may take at least two years to bear fruit.

## Deletions from the list of doctoral students

In the academic year 2023/2024, 7 doctoral students were deleted.

*Table 16. Number of deletions*

| | Academic year | | | | |
|---|---|---|---|---|---|
| Recruitment | 2020-2021 | 2021-2022 | 2022-2023 | 2023-2024 | Total |
| 2019 | 3 | 3 | 0 | 5 | 11 |
| 2020 | 1 | 1 | 5 | 2 | 9 |
| 2021 | 0 | 5 | 3 | 0 | 8 |
| 2022 | 0 | 0 | 1 | 0 | 1 |
| Total | 4 | 9 | 9 | 7 | 29 |

The reasons for the deletions are as follows:

- 2 people were deleted due to unsatisfactory progress in the preparation of the doctoral dissertation,
- 1 doctoral student due to failure to submit a report on the implementation of IPB for the third year of education,
- 3 PhD students due to failure to submit their dissertation on time,
- 1 person due to resignation from education.

Taking into account the paid doctoral scholarships, the deletion of one doctoral student in the following years of education generates the following cost for the university budget:

- After the first year PLN48,754.32
- After the second year PLN97,508.64
- After the third year PLN172,616.65

- After the fourth year PLN247,724.66

## Completion of education

This academic year, the dissertation was submitted by:
- 6 PhD students within the deadline provided for in IPB,
- 1 PhD student at an earlier date (in the third year),
- 4 PhD students after extension,

and thus completed their education at the Doctoral School.

The table below summarizes the number of all graduates of SzD.

*Table 17. Statistics of PhD students who have completed their education*

| PhD students by discipline in years | Recruitment | | | |
|---|---|---|---|---|
| Discipline | 2019 | 2020 | 2021 | Total |
| Technical Informatics and Telecommunications | | 1 | | 1 |
| Mechanical Engineering | 3 | 3 | | 6 |
| Agriculture and horticulture | 1 | 2 | | 3 |
| Zootechnics and fisheries | | | 1 | 1 |
| Total | 4 | 6 | 1 | 11 |

## Summary

In the sixth year of education, 34 doctoral students are educated at the PBŚ Doctoral School. The table below presents the number of doctoral students, taking into account the discipline in which the dissertation is carried out.

*Table 18. Number of PhD students*

| Discipline | Current state |
|---|---|
| Technical Informatics and Telecommunications | 2 |
| Civil engineering, surveying and transport | 4 |
| Mechanical Engineering | 13 |
| Chemical Sciences | 4 |
| Management and Quality Sciences | 1 |
| Agriculture and horticulture | 7 |
| Zootechnics and fisheries | 3 |
| Total | 34 |

## 10. Applications

1. As in the previous year, the implementation of the doctoral students' education program went without reservations. This is evidenced by the very good grades of doctoral students obtained as part of the course credits, positive opinions in doctoral surveys on classes, lecturers and educational conditions, as well as positive results of class observation.

2. The implementation of IPB by PhD students still raises major reservations due to:
   - a high percentage of extensions granted at the end of this academic year,
   - very low educational efficiency, which is 2/11.

3. The reasons for the low efficiency of education are most likely to:
   - insufficient sponsor care,
   - insufficient involvement of doctoral students in the implementation of the IPB after the mid-term evaluation,
   - personal problems of doctoral students, disclosed only in applications for extension,
   - insufficient supervision over the implementation of the dissertation as part of doctoral seminars.

4. On the basis of satisfaction surveys, the most common postulates of doctoral students can be listed, namely:
   - will move education to the beginning or end of the week;
   - more intensive improvement of conference speaking and writing skills in English;
   - changes in the operation of APD and USOS digital systems;
   - modernization in terms of bathrooms, accessibility for disabled people and parking spaces.

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# CRITERION 3

# Qualifications of academic teachers or research staff conducting education at the doctoral school

## information and communication technology

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# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Michał Choraś

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

Professor, Technical Informatics and Telecommunications, Professor since 2021

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

Grant toolkit

**List of functions of supervisor or assistant supervisor of doctoral dissertations:**

1. Agata Giełczyk, PhD
2. Sebastian Łaskawiec, PhD
3. Marek Pawlicki, Ph.D.

**List of reviews in the procedure for scientific promotion:**

Applications for the title of professor (RDN):

1. Jordi Batalla, 2023.

Habilitation applications – reviews and committees:

1. Kaczmarek A., Technical University Gdańsk (PG), 2023 (review).
2. Josinski H., Silesian University of Technology, 2020.
3. Szwoch G., Technical University Gdańsk (PG), 2020.
4. Doroz R., Bialystok University of Technology, 2019.
5. Bielecka M., AGH Cracow, 2019 (review).
6. Cabaj K., Warsaw University of Technology, 2019 (review).
7. Oszust M., Częstochowa University of Technology, 2019.
8. December K. Lodz University of Technology, 2019.
9. Naruniec J., Warsaw University of Technology, 2018/2019.
10. Niemiec M., AGH Cracow, 2018/2019.

Reviews of PhD theses:

1. Szymkowski P., PhD Thesis, Bialystok University of Technology (PB), 2024.
2. Wesołowski T., PhD Thesis, University of Silesia (US), 2024.
3. Plucinska R, PhD Thesis, Warsaw University of Technology (PW), 2023.
4. Janiszewski M., PhD Thesis, Warsaw University of Technology (PW), 2023.
5. Szostak D., PhD Thesis, Wrocław University of Science and Technology (PWr), 2023.
6. Walkowski M., PhD Thesis, Wrocław University of Science and Technology (PWr), 2022
7. Kaspar David Hageman, PhD Thesis, AAU, Aalborg, Denmark, 2022.
8. Koziarski M., PhD Thesis, AGH Cracow, 2021.
9. Biedrzycki J., PhD Thesis, Wrocław University of Science and Technology (PWr), 2021.
10. Friedjungova M., PhD Thesis: ADVANCED METHODS OF ASYMMETRIC HETEROGENEOUS

11. TRANSFER LEARNING, Informatics, Faculty of Information Technology, Czech Technical
12. University in Prague, 2021.
13. Jakubowska M., PhD Thesis, Warsaw University of Technology (Faculty: WE), 2020.
14. Nowak P., PhD Thesis, Lodz University of Technology, 2020.
15. Trokielewicz M., PhD Thesis, Warsaw University of Technology (Faculty: WETI), 2019.
16. Kidmose E., PhD Thesis, AAU, Aalborg, Denmark, 2019.

**List of scientific publications:**

http://michal-choras.com/michal.choras-publications.html

The high level of my scientific achievements in 2022-2023 is characterized by:

- Inclusion in the Top2% of scientists (Elsevier/Stanford) in 2021 (main list and list for 2020)
- Inclusion in the Top2% of scientists (Elsevier/Stanford) in 2022 (main list and list for 2021)
- Inclusion in the Top2% of scientists (Elsevier/Stanford) in 2023 (main list and list for 2022)

| Bibliographic database | SCOPUS | Google Scholar |
|---|---|---|
| Indexed works | 247 | 364 |
| Total citations | >2520 | >5000 |
| Hirsch index | 26 | 36 |

List of publications for 2024

1. Choras Michał, Pawlicki M., Kozik R., Pawlicka A., Tech developers must respect equitable AI access, NATURE, vol. 625 (663), 2024. (IF=64,8).
2. Pawlicki M., Pawlicka, A., Kozik R., Choras Michal, The survey on the dual nature of xAI challenges in intrusion detection and their potential for AI innovation, Artif Intell Rev 57, 330, December 2024. (IF=10,7) (Open Access for download)
3. Kozik R., Katek G., Gackowska M., Kula S., Komorniczak J., Ksieniewicz P., Pawlicka A., Pawlicki M., Choras Michał, Towards explainable fake news detection and automated content credibility assessment: Polish internet and digital media use-case Neurocomputing vol. 608, 1284502024, Elsevier, December 2024. (IF=5,5). (Open Access for download)
4. Pawlicki M., Pawlicka A., Uccello F., Szelest S., D'Antonio S., Kozik R., Choras Michal, Evaluating the necessity of the multiple metrics for assessing explainable AI: A critical examination, Neurocomputing vol. 602, Elsevier, October, 2024. (IF=5.5). (Open Access for download)
5. Pawlicka A., Pawlicki M., Kozik R., Andrychowicz-Trojanowska A., Choras Michał, AI vs Linguistic-Based Human Judgement: Bridging the Gap in Pursuit of Truth for Fake News Detection, Information Sciences, Volume 679, 121097, Elsevier, September 2024.
6. Kozik R., Pawlicka A., Pawlicki M., Choras Michał, Mazurczyk W. and Cabaj K., A Meta-Analysis of State-of-the-Art Automated Fake News Detection Methods, IEEE Transactions on Computational Social Systems, vol. 11, issue 4, 5219-5229. August 2024. doi: 10.1109/TCSS.2023.3296627 (IF=4.5).
7. Pawlicki, M., Pawlicka, A., Kozik, R., Choras Michal, Advanced insights through systematic analysis: Mapping future research directions and opportunities for xAI in deep learning and artificial intelligence used in cybersecurity, Neurocomputing, vol. 590, Elsevier, July 2024. (IF=6). (Open Access for download)
8. Kozik R., Ficco M., Pawlicka A., Pawlicki M., Palmieri F., Choras Michal, When explainability turns into a threat - using xAI to fool a fake news detection method, Computers & Security, vol. 137, February 2024, Elsevier (IF=5,6). (Open Access for download)

9. Karhapää P., Behutiye W., Seppänen P., Rodríguez P., Oivo M., Franch X., Martínez-Fernández S., López L., Choras Michal, Bagnato A., Aaramaa S., Partanen J., Evidence-based quality-aware agile software development process: Design and evaluation, IEEE Access, vol. 12, pages 86487 - 86512, 2024. (IF=3,4). (Open Access for download)
10. Pawlicki M., Pawlicka A., Kozik R., Choras Michal, Explainability versus Security: The Unintended Consequences of xAI in Cybersecurity, In: SecTL '24: Proceedings of the 2nd ACM Workshop on Secure and Trustworthy Deep Learning Systems, p. 1-7, ACM Asia CCS, July 2024, Singapore 2024 (CORE A).
11. Choras Michał, Pawlicka A., Jaroszewska-Choras D., Pawlicki M., Not only Security and Privacy: the evolving ethical and legal challenges of E-Commerce, In: Katsikas, S., et al. Computer Security. ESORICS 2023 International Workshops. ESORICS 2023. Lecture Notes in Computer Science, vol 14398. 167-181, Springer, 2024. (CORE A).
12. Pawlicka A., Pawlicki M., Kozik R., Choras Michal, To Teach to Hack or Not: The Grey Zone of Cybersecurity Education, In: Proceedings of the fortieth INFORMATION SYSTEMS EDUCATION CONFERENCE, ISECON, 69-81, October 2024.(CORE B).
13. Kozik R., Pawlicka A., Pawlicki M., Choras Michał, From Detection Through Display to Understanding: Bridging AI and UI in Disinformation and Fake News Analysis , in: N.-T. Nguyen et al. (Eds.): Advances in Computational Collective Intelligence, ICCCI 2024, ICCCI 2024, Communications in Computer and Information Science, vol 2165, 347–357. Springer, 2024. (CORE B).
14. Cabaj K., Kowalczyk M., Gregorczyk M., Choras Michał, Kozik R., Mazurczyk W., Strategies to Use Harvesters in Trustworthy Fake News Detection Systems , in: N.-T. Nguyen et al. (Eds.): Advances in Computational Collective Intelligence, ICCCI 2024, Communications in Computer and Information Science, vol 2165, 384–394. Springer, 2024. (CORE B).
15. Pawlicki M, Puchalski D., Szelest S., Pawlicka A., Kozik R., Choras Michal,Introducing a Multi-Perspective xAI Tool for Better Model Explainability , In: ARES '24: Proceedings of the 19th International Conference on Availability, Reliability and Security July 2024, Vienna (CORE B).
16. Puchalski D., Pawlicki M, Kozik R., Renk R., Choras Michal,Trustworthy AI-based Cyber-Attack Detector for Network Cyber Crime Forensics, In: ARES '24: Proceedings of the 19th International Conference on Availability, Reliability and Security July 2024, Vienna (CORE B).
17. Komisarek M., Pawlicki M, D'Antonio S., Kozik R., Pawlicka A., Choras Michal,Enhancing Network Security Through Granular Computing: A Clustering-by-Time Approach to NetFlow Traffic Analysis , In: ARES '24: Proceedings of the 19th International Conference on Availability, Reliability and Security July 2024, Vienna (CORE B).
18. Uccello F., Pawlicki M., D'Antonio S., Kozik R., Choras Michal, A novel approach to the use of explainability to mine network intrusion detection rules , In Nguyen, N.T., et al. Intelligent Information and Database Systems. ACIIDS 2024. LNCS vol. 14795, 70-81, 15-18 April 2024, Ras Al Khaimah, UAE, Springer, 2024 (CORE B).
19. Kozik R., Puchalski D., Pawlicka A., Bus Sz., Główka J., Chandramouli K., Tiemann M., Pawlicki M., Renk R., Choras Michał, ULTIMATE Project Toolkit for Robotic AI-Based Data Analysis and Visualization , In Nguyen, N.T., et al. Intelligent Information and Database Systems. ACIIDS 2024. LNCS vol. 14796, 44-55, 15-18 April 2024, Ras Al Khaimah, UAE, Springer 2024 (CORE B).
20. Katek G., Gackowska M., Komorniczak J., Ksieniewicz P., Kozik R., Pawlicki M., Choras Michał, Involving Society to Protect Society from Fake News and Disinformation: Crowdsourced Datasets and Text Reliability Assessment , In Nguyen, N.T., et al. Intelligent Information and Database Systems. ACIIDS 2024. LNCS vol. 14796, 384-395, 15-18 April 2024, Ras Al Khaimah, UAE, 2024 (CORE B).

21. Pawlicki M., Kozik R., Choras Michal, The Impact of Data Scaling Approaches on Deep Learning, Random Forest and Nearest Neighbour-Based Network Intrusion Detection Systems for DoS Detection in IoT Networks, In: You, I., Choraś, M., Shin, S., Kim, H., Astillo, P.V. (eds): Mobile Internet Security. MobiSec 2023, Okinawa, Japan, CCIS vol 2095, Springer, Singapore, 2024.
22. Uccello F., Pawlicki M., D'Antonio S., Kozik R., Choras Michal, Comparative Analysis of AI-Based Methods for Enhancing Cybersecurity Monitoring Systems , In: O. Gervasi et al. (Eds.): Computational Science and Its Applications – ICCSA 2024 Workshops, LNCS 14816, Hanoi, Vietnam, July 2024.
23. Uccello F., Pawlicki M., D'Antonio S., Kozik R., Choras Michal, Towards Hybrid NIDS: Combining Rule-Based SIEM with AI-Based Intrusion Detectors, in: Daimi, K., Al Sadoon, A. (eds) Proceedings of the Second International Conference on Advances in Computing Research (ACR'24). Lecture Notes in Networks and Systems, vol 956., 244-255, Madrid, Spain, 2024.
24. Uccello F., Pawlicki M., D'Antonio S., Kozik R., Choras Michal, An Innovative Approach to Real-Time Concept Drift Detection in Network Security, In: Barolli, L. (eds) Advances in Internet, Data & Web Technologies. EIDWT 2024. Lecture Notes on Data Engineering and Communications Technologies, vol 193, 130-139, Naples, Italy, 2024 (Springer).
25. Pawlicka A., Pawlicki M., Kozik R., Choras Michal, The Rise of AI-Powered Writing: How ChatGPT is Revolutionizing Scientific Communication - For Better or For Worse, In: Huang, DS., Premaratne, P., Yuan, C. (eds) Applied Intelligence. ICAI 2023. Communications in Computer and Information Science, vol 2014, 317-327, December 8-12, 2023, Nanning, China Springer, 2024.
26. Uccello F., Pawlicki M., D'Antonio S., Kozik R., Choras Michal, Effective Rules for a Rule-Based SIEM System in Detecting DoS Attacks: An Association Rule Mining Approach, In: Huang, DS., Premaratne, P., Yuan, C. (eds) Applied Intelligence. ICAI 2023. Communications in Computer and Information Science, vol 2015, 236-246, Nanning, China, Springer, 2024.
27. Pawlicka, A., Pawlicki, M., Kozik, R., Kurek, W., Choras Michał, How Explainable Is Explainability? Towards Better Metrics for Explainable AI., in: Visvizi, A., Troisi, O., Corvello, V. (eds) Research and Innovation Forum 2023. RIIFORUM 2023. Springer Proceedings in Complexity. Springer, 2024.
28. Books - 2024
29. Garcia-Alfaro J., Kozik R., Choras Michal, Katsikas S., Computer Security – ESORICS 2024, 29th European Symposium on Research in Computer Security, Bydgoszcz, Poland, September 16–20, 2024, Proceedings, Part I, LNCS vol. 14982, 2024.
30. Garcia-Alfaro J., Kozik R., Choras Michal, Katsikas S., Computer Security – ESORICS 2024, 29th European Symposium on Research in Computer Security, Bydgoszcz, Poland, September 16–20, 2024, Proceedings, Part II, LNCS vol. 14983, 2024.
31. Garcia-Alfaro J., Kozik R., Choras Michal, Katsikas S., Computer Security – ESORICS 2024, 29th European Symposium on Research in Computer Security, Bydgoszcz, Poland, September 16–20, 2024, Proceedings, Part III, LNCS vol. 14984, 2024.
32. Garcia-Alfaro J., Kozik R., Choras Michal, Katsikas S., Computer Security – ESORICS 2024, 29th European Symposium on Research in Computer Security, Bydgoszcz, Poland, September 16–20, 2024, Proceedings, Part IV LNCS vol. 14985, 2024.
33. You, I., Choras Michal, Shin, S., Kim, H., Astillo, P.V., Mobile Internet Security. MobiSec 2023, Communications in Computer and Information Science, vol 2095. Springer, Singapore. https://doi.org/10.1007/978-981-97-4465-7_14

**List of patents and protective works:**
lack

**List of active participation in conferences:**
Organization of conferences and sessions (selected):

1. General Co-Chair of ESORICS 2024: European Symposium on Research in
2. Computer Security, Bydgoszcz, Poland, September 2024 (CORE A).
3. https://esorics2024.org/
4. Al. Prof. S. Kaliskiego 7, 85-796 Bydgoszcz - 3 - www.pbs.edu.pl
5. tel. +48 52 374 93 30, fax +48 52 374 93 27 e-mail: szkola.doktorska@pbs.edu.pl
6. 13th International Conference on Image Processing and Communications (IP&C'23)
7. –General Chair
8. https://ipc.pwr.edu.pl
9. The 7th International Conference on Mobile Internet Security, Okinawa, Japan –
10. Programme Chair
11. Special Session Co-Chair at DSAA 2023: Computational methods for emerging
12. problems in disinformation analysis (DISA), Thessaloniki, Greece, October 2023
13. Special Session CO-CHAIR: Lifelong Learning: recent advances and challenges (L3-
14. RAC) 2023, @ IJCNN, June 18 - June 23, 2023, Gold Coast, Queensland, Australia.
15. Award Committee Chair at ICAI 2023: International Conference on Applied
16. Intelligence, Nanning, Guangxi, China, December 8-12, 2023
17. Special Session CO-CHAIR: Life-Long Learning in Practical Applications - L3-IPA
18. 2022, @ IJCNN/WCCI, July 2022, Padova, Italy. (CORE A)
19. Workshop TPC CO-CHAIR: Cyber-Security in Software-defined and Virtualized
20. Infrastructures (SecSoft) - SecSoft 2022, @Netsoft, July 2022, Milan, Italy.
21. Special Session CO-CHAIR: ADVANCED AND RELIABLE SOLUTIONS TO
22. COUNTER MALWARE AND STEGOMALWARE - DETONATOR 2022, @
23. EICC, June 2022, Barcelona, Spain.
24. Conference Publication Co-Chair: International Conference on Intelligent Computing, ICIC 2022, August 7-11, 2022, Xi'an, China

**List of scholarships and scientific internships:**
Prof. Michał Choraś is employed (since 2017) at FernUniversitat in Hagen, Hagen, Germany

**List of participation in scientific grants:**

1. H2020 SIMARGL (Secure Intelligent Methods for Advanced RecoGnition of malware and stegomalware) – as coordinator of the entire project
2. FP7 CAMINO - – as coordinator of the entire project
3. H2020 SocialTruth (as scientific coordinator),
4. H2020 SPARTA (SAFAIR Programme Leader)
5. SWAROG (INFOSTRATEG) (NCBiR),
6. Horizon Europe AI4CYBER,
7. Horizon Europe ULTIMATE,
8. H2020 STARLIGHT,
9. H2020 APPRAISE,
10. H2020 SILVANUS,
11. H2020 ELEGANT,
12. H2020 InfraStress,

13. EDIDP HERMES,
14. H2020 Q-Rapids,
15. H2020 MAGNETO,
16. H2020 PREVISION,
17. H2020 ENSURENSEC,
18. DeCoIMa (German),
19. IMACOSAR (German),
20. StegoMaCoFi (German),
21. H2020 SATIE

**Other important academic and professional achievements:**
lack

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# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Piotr Kiedrowski

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

technical sciences, Ph.D./ technical sciences, Informatics and Telecommunications/ 4.VII 2002

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

Contemporary Trends in Scientific Development

The following lists refer to the last 5 years, with particular emphasis on achievements related to classes conducted at the Doctoral School of the Bydgoszcz University of Technology.

**List of doctoral dissertation supervisor functions:**
lack

**List of reviews in the procedure for scientific promotion:**
1. PhD dissertation: Maria Stefan, 2019, Automation of Smart Grid Operations Through Spatio-Temporal Data-Driven Systems, Technical Faculty of IT and Design, Aalborg University, ISSN (online): 2446-1628, ISBN (online): 978-87-7210-445-4

**List of scientific publications:**
1. Year: 2024; Authors: Kiedrowski Piotr.; Title: Three Methods of Selecting a Smart Meter for Data Concentration in the Automatic Meter Reading Last Mile Network; Journal: Bulletin of the Polish Academy of Sciences: Technical Sciences; Impact Factor: 1.200; Total score of the Ministry of Science and Higher Education: 100,000; DOI: 10.24425/bpasts.2023.146476
2. Year: 2022; Authors: Kiedrowski Piotr, Zabłudowski Łukasz, Marciniak Beata.; Title: Smart Meters Reading Process Improvement by UAV Utilization; Title: In: Progress in Image Processing, Pattern Recognition and Communication Systems Proceedings of the Conference (CORES, IP& C, ACS) / Michał Choraś, Ryszard S. Choraś, Marek Kurzyński, Paweł Trajdos, Jerzy Pejaś, Tomasz Hyla ; Total score of the Ministry of Science and Higher Education: 20,000; URL: https://link.springer.com/book/10.1007/978-3-030-81523-3; DOI: 10.1007/978-3-030-81523-3
3. Year: 2021; Authors: Kiedrowski Piotr, Saganowski Łukasz.; Title: METHOD OF ASSESSING THE EFFICIENCY OF ELECTRICAL POWER CIRCUIT SEPARATION WITH THE POWER LINE COMMUNICATION FOR RAILWAY SIGNS MONITORING; Journal: Transport and Telecommunication Journal; URL: https://sciendo.com/article/10.2478/ttj-2021-0031; DOI: 10.2478/ttj-2021-0031
4. Year: 2021.; Authors: Kiedrowski Piotr, Marciniak Beata.; Title: Pass/Fail Quality Assessment in Last Mile Smart Metering Networks Based on PRIME Interface; Magazine: Sensors; Impact Factor: 3.847; Total score of the Ministry of Science and Higher Education: 100,000; URL:

https://www.mdpi.com/1424-8220/21/22/7444; DOI: 10.3390/s21227444

5. Year: 2021; Authors: Kiedrowski Piotr.; Title: Selection of the Optimal Smart Meter to Act as a Data Concentrator with the Use of Graph Theory; Journal: Entropy; Impact Factor: 2.738; Total score of the Ministry of Science and Higher Education: 100,000; DOI: 10.3390/e23060658
6. Year: 2020.; Authors: Kiedrowski Piotr.; Title: Retransmission as a Replacement Forward Error Correction in Noiseless LV Networks used for Narrowband PLC; Journal: Journal of Telecommunications and Information Technology; Total score of the Ministry of Science and Higher Education: 40,000; URL: https://www.il-pib.pl/czasopisma/JTIT/2020/2/91.pdf; DOI: 10.26636/jtit.2020.143620

**List of patents and protective works:**
lack

**List of active participation in conferences:**

1. International Conference on Image Processing & Communication remotely: 28-30 June 2021
2. International Conference on Intelligent Solutions for Industry – ISI 2022, Bydgoszcz: 24-25 November 2022

**List of scholarships and scientific internships:**

1. Research internship 17.07-31.08.2023 George Emil Palade University of Medicine, Pharmacy, Science, and Technology of Targu Mures, Romania, Faculty of EE and IT

**List of participation in scientific grants:**
lack

**Other important academic and professional achievements:**

1. Academic textbook: Python: Your First Programming Language, Author Piotr Kiedrowski, University Publishing House, Bydgoszcz University of Technology, 2024

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# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Leszek Szychta

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

Professor, technical sciences, automation, electronics, electrical engineering and space technologies, engineer, 2013

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

Efficient energy conversion in agricultural technology

**List of functions of supervisor or assistant supervisor of doctoral dissertations:**
lack

**List of reviews in the procedure for scientific promotion:**
Evaluation of the scientific, didactic and promotion achievements of the scientific staff and position in the scientific community of Sebastian Marcin Borucki, PhD, DSc, Eng., Professor of the Opole University of Technology, applying for the title of professor of technical sciences

**List of scientific publications:**

1. The influence of electromagnetic field on honey bee workers – review paper
2. The Dielectric Properties of Worker Bee Homogenate in a High Frequency Electric Field
3. Destructive states in the area defined as a no-damage region in the ITIC / SEMI F47 curve

**List of patents and protective works:**

1. P.445648, Insect Mobility Test Equipment Set and Insect Motility Test Method

**List of active participation in conferences:**

1. 2022 ELEKTRO (ELEKTRO)
2. 2024 ELEKTRO (ELEKTRO)

**List of scholarships and scientific internships:**
lack

**List of participation in scientific grants:**
lack

**Other important academic and professional achievements:**
lack

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HR EXCELLENCE IN RESEARCH

# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Witold Hołubowicz

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

D.Sc. – 1993 (Poznan University of Technology)
PhD – 1986 (Poznan University of Technology)
M.Sc. – 1981 (Poznan University of Technology)

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

1. Project, team and social communication management

**List of functions of supervisor or assistant supervisor of doctoral dissertations:**

1. Supervisor of Henryk Gierszal, M.Sc. Eng. (Bydgoszcz University of Technology)
2. Supervisor Rafał Renk, M.Sc. Eng. (Bydgoszcz University of Technology)
3. Supervisor of Piotr Tyczka, M.Sc. (Poznan University of Technology)

**List of reviews in the procedure for scientific promotion:**

lack

**List of scientific publications:**

1. Pawlicki M., Choraś M., Kozik R., Hołubowicz W., On the Impact of Network Data Balancing in Cybersecurity Applications, in Krzhizhanovskaya V.V. et al. (Eds.): Computational Science – ICCS 2020, LNCS vol. 12140, 196-210, Springer, Amsterdam, 2020
2. Kozik R., Choraś M., Pawlicki M., Hołubowicz W., Pallmer D., Mueller W., Behmer E.-J., Loumiotis I., Demestichas K., Horincar R., Laudy C., Faure D., Common Representational Model and Ontologies for Effective Law Enforcement Solutions, Vietnam Journal of Computer Science, vol. 7, issue 1, 1-18, February, 2020
3. Choraś M., Kozik R., Pawlicki M., Hołubowicz W., Franch X., Software Development Metrics Prediction Using Time Series Methods, In: Saeed K. et al. (Eds.): Computer Information Systems and Industrial Management, CISIM 2019, Belgrade, Serbia, LNCS 11703, 311-323, Springer, 2019
4. Kozik R., Choraś M., Pawlicki M., Hołubowicz W., Pallmer D., Mueller W., Behmer E.-J., Loumiotis I., Demestichas K., Horincar R., Laudy C., Faure D., The Identification and Creation of Ontologies for the Use in Law Enforcement AI Solutions – MAGNETO Platform Use Case, In: N. T. Nguyen et al. (Eds.): Computational Collective Intelligence, ICCCI 2019, Hendaye, France, LNAI 11684, 335-345, Springer, 2019

**List of patents and protective works:**
lack

**List of active participation in conferences:**
lack

**List of scholarships and scientific internships:**

1. In the years 1984-2002 scientific internships in France and Japan
2. 3-year stay at the New York University of Technology as Visiting Professor (1986-89)

**List of participation in scientific grants:**

1. SocialTruth - pen Distributed Digital Content Verification for Hyper-connected Sociality Grant no 825477 2018-2021, H2020 ICT
2. InfraStress – Improving resilience of sensitive industrial plants & infrastructures exposed to cyber-physical threats, by means of an open testbed stress-testing system Grant no 833088 2019-2021, H2020 INFRA
3. SWAROG - Artificial Intelligence Disinformation Detection System NCBiR Infostrateg I 2022-2025

**Other important academic and professional achievements:**

1. Co-founder (1996) and long-term President of the Management Board (1997-2016) in a high-tech company called ITTI sp z o.o. (about 100 employees)

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# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Tomasz Talaśka

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

D.Sc. Eng. / Automatic Control, Electronics, Electrical Engineering, 2019 (Gdańsk University of Technology)
Ph.D. Eng. / Telecommunications (PBS)

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

Artificial Intelligence and modern methods of data processing in scientific research

**List of functions of supervisor or assistant supervisor of doctoral dissertations:**

1. Krzysztof Pałczyński
2. Jacek Suty

**List of reviews in the procedure for scientific promotion:**

1. Adam Żywica (PhD) ZUT Szczecin - 2022
2. Dominika Karpińska (PhD) NCU Toruń - 2023
3. Michał Jasiński (PhD) AGH University of Science and Technology Krakow - 2024

**List of scientific publications:**

1. Długosz Z, Talaśka T, Długosz R., A method supporting hardware implementation of vector quantization module in HOG Algorithm, in: 31 st International Conference on Mixed Design Of Integrated Circuits and System (MIX DES), IEEE, 2024, 75-79 : bibliogr.. summ. , doi: 10.23919/MIXDES62605.2024.10613948
2. Cierpiak K, Wityk P, Kosowska M, Sokołowski P, Talaśka T, Gierowski J, Markuszewski M, Szczerska M.
3. C-reaetive protein (CRP) evaluation in human urine using Optical sensor supported by machine learning Scientific Reports, - 2024, 14, 18854, 1-10, bibliogr., summ. , fig., tab., doi: 10.1038/s41598-024-67821-O
4. Trofimowicz D, Stefański T, Gulgowski J, Talaska T., Modelling and simulations in time-fractional electrodynamics based on control engineering methods, Communications in Nonlinear Science and Numerical Simulation, - 2024, 129. 107720, 1-20, bibliogr-, summ., rys., tab., Available from: https://doi.org/10.1016/j.cnsns.2023.107720
5. Długosz Z, Rajewski M, Długosz R, Talaśka T, Pedrycz W., A new deterministic PSO algorithm for real-time systems implemented on low-power devices, Journal Of Computational and Applied Mathematics 2023, 429, 115225, 1-18, bibliogr., summ., fig., tab., doi: 10.1016/j.cam.2023.115225
6. Talaśka T, Długosz R, Nikolić T, Stefański T, Długosz M, Talaśka M., A New, Recontigurable Circuit Offering Functionality of AND OR Logic Gates for Use in Algorithms Implemented in

Hardware, In: W: 33rd International Conference on Microelectronics (MIEL), : Institute of Electrical and Electronics Engineers (IEEE), 2023, 1-4: bibliogr" summ., fig., tab., Available from: https://ieeexplore.ieee.org/document/10315945

7. Talaśka T, Długosz Z, Długosz R., A novel hardware implemented programmable controller adapted to cooperate with AI tuning algorithms in real time systems, Journal of Computational and Applied Mathematics, - 2023, 428, 115162, 1-8, bibliogr., summ. , fig., tab., doi: 10.1016/j.cam.2023.115162
8. Długosz Z, Długosz R, Talaśka T., A novel, tlexible circuit used to implement selected mathematical operations for AI algorithms optimized for hardware applications, Journal Of Computational and Applied Mathematics, - 2023, 428, 115160, 1-14, bibliogr., summ., rys., tab., doi: 10.1016/j.cam.2023.115160
9. Bogacki P, Długosz M, Talaśka T, Długosz R., A parallel and asynchronous blob shapc descriptor implemented in CMOS technology, in: W: 33rd International Conference on Microelectronics (MIEL): Institute of Electrical and Electronics Engineers (IEEE), 2023, 1-4: bibliogr" summ" fig., tab.
10. Kloska S, Pałczyński K, Marciniak T, Talaška T, Miller M, Wysocki B, Davis P, Wysocki T., Conversion of fał to cellular fue1—Fatty acids g-oxidation model, Computational Biology and Chemisuy, - 2023, 104, -, 1-7, fig., excl., bibliogr., summ., doi: 10.1016/j.compbiolchem.2023.107860
11. Bogacki p, Długosz Z, Banach M, Talaśka T, Długosz R., Detection of Unoccupied Areas of the Road in Images from Mono Camera with Use of Multilevel Image Decomposition, In: W: 30th International Conference on Mixed Design Of Integrated Circuits and System (MIXDES), : IEEE, 2023, 226-231 : Bibliogr., fig., summ., doi: 10.23919/MlXDES58562.2023.10203225
12. Pałczyński K, Czyżewska M, Talaśka T, Fuzzy Gaussian Decision Tree, Journal of Computational and Applied Mathematics, - 2023, 425, II 5038, 1-10, bibliogr" summ., rys., tab., doi: 10.1016/j.cam.2022.115038
13. Kloska S, Pałczyński K, Marciniak T, Talaśka T, Wysocki B, Davis P, Wysocki T., Integrating glycolysis, citric acid cycle, pentose phosphate pathway, and fatty acid beta-oxidation into a single computational model, Scientific Reports, - 2023, 13, 14484, 1-13, bibliogr., summ., rys., tab., doi: 10.1038/s41598-023-41765-3
14. Stankovic L, Nikolic T, TalaŚka T, Długosz R., Performance Evaluation of YOLO Models for Automatic Crop and Weed Detection, In: W: 33rd International Conference on Microelectronics (MIEL), : Institute of Electrical and Electronics Engineers (IEEE), 2023, 1-4 : bibliogr., summ., fig., tab.
15. Banach M, Bogacki P, Długosz Z, Talaska T, Długosz R., Solutions for Creating Virtual Tracks for Autonomous Vehicles, Based on Vehicle-to-Infrastructure Technology, In: W: 30th International Conference on Mixed Design of Integrated Circuits and System (MIXDES), : IEEE, 2023, 238-243 : Bibliogr-, fig., summ,doi: 10.23919/MlXDES58562.2023.10203260
16. Banach M, Długosz R, Talaśka T, Pedrycz W., Air Pollution Monitoring System with Prediction Abilities Based on Smart Autonomous Sensors Equipped with ANNs with Novel Training, Scheme Remote Sensing, - 2022, 14, 413, bibliogr., fig., tab.
17. Kloska S, Pałczyński K., Marciniak T, TalaSka T, Miller M, Wysocki B, Davis P, Soliman G, Wysocki T., Queueing theory model of mTOR complexes' impact on Akt-mediated adipocytes response to insulin PLOS One, - 2022, -, -, I-13, fig., bibliogr., summary, doi: 10.1371/journal.pone.0279573
18. Kloska S, Pałczyński K, Marciniak T, Talaśka T, Miller M, Wysocki B, Davis P, Wysocki T., Queueing theory model of pentose phosphate pathway, Scientific Reports, - 2022, 12, 4601, 1-9, tab., exc., bibliogr., abstract-, doi: 10.1038/s41598-022-08463-y

19. Długosz Z, Rajewski M, Długosz R, Talaśka, A Novel, Low Computational Complexity, Parallel Swarm Algorithm for Application in Low-Energy Devices, Sensors, - 2021, 21, 1-25, bibliogr., rys., tab., summ., doi: 10.3390/s21248449
20. Kloska S., Pałczyński K, Marciniak T, Talaśka T, Nitz M, Wysocki B, Davis P, Wysocki T., Queueing theory model of Krebs cycle, Bioinformatics, - 2021, 37, 15, 2912•2919, bibliogr., abstract, doi: 10.1093pbioinformaticsibtab177
21. Banach M, Długosz Z, Długosz R, Talaśka T., The Use of Artificial Neural Networks In Predicting Air Pollution In Cities Hardware Implementation Issues, in: 32nd INTERNATIONAL CONFERENCE ON MICROELECTRONICS (MIEL), : IEEE, 2021, pp. 271-274 : bibliogr., fig., tab., summ.
22. Banach M, Długosz R, Pauk J, Talaśka T., Hardware Effcient Solutions for Wireless Air Pollution Sensors Dedicated to Dense Urban Areas, Remote Sensing, 2020, 12, 776, 1-25, bibliogr., Summ. , tab., excerpt fig., doi: 10.3390/RS12050776
23. Długosz Z, Rajewski M, Banach M, Talaśka T, Długosz R., Low Hardware Complexity Filters for On-chip Algorithm Used in Air Pollution Sensors for Dense Urban Areas in Smart Cities, In: 2020 27th International Conference on Mixed Design of Integrated Circuits and System (MIXDES), : IEEE, 2020, 101-106 : bibliogr., summ., fig., tab.
24. Rajewski M, Długosz Z, Długosz R, Talaśka T., Modified particle swarm optimization algorithm facilitating iłs hardware implementation, in: 2020 27th International Conference on Mixed Design of Integrated Circuits and System (MIXDES), . IEEE, 2020, 227-231 : bibliogr., summ., excl.
25. Banach M, TalaŚka T, Dalecki J, Długosz R., New technologies forsmart cities - high-resolution air pollution maps based on intelligent sensors, Concurrency and Computation Practice and Experience, - 2020, 32, 13, 1-15, bibliogr., summ., rys, doi: 10.1002/cpe.5179
26. Dalecki J, Długosz R, Talaśka T, Fischer G., A Low Power, Low Chip Area, Two-stage Current-mode DAC Implemented in CMOS 130 nm Technology, In: W: 2019 MIXDES - 26th International Conference "Mixed Design Of Integrated Circuits and Systems't, : IEEE, 2019, 151-156 : bibliogr., summ., tab., excl., fig., doi: 10.23919iMIXDES,2019.8787079
27. Długosz R, Talaśka T, Nikolić T, Nikolić G., A Parallel Adaptive LMS FIR Filter Realized in CMOS Technology, in: W: 31 St International Conference on Microelectronics (MIEL), : IEEE, 2019, 281-284 : bibliogr., summ., wykr.,
28. Dalecki J, Długosz R, Talaśka T, Fischer G., A programmable current-mode digital-to-analog converter with correction of nonlinearity of input-output characteristics, In: W: 31 St International Conference on Microelectronics (MIEL), : IEEE, 2019, 277-280: bibliogr., summ., wykr.
29. Banach M, Długosz R, Talaśka T, Hardware Implementation of Selected Statistical Quantities for Applications in Automotive V21 Communication System, in: W: 31 St International Conference on Microelectronics (MIEL), IEEE, 2019, 227-230: bibliogr., summ., fig., excl.
30. Talaśka T., Parallel asynchronous fuzzylogic systems realized in CMOS technology, Advances in Computational Mathematics, - 2019, 45, 4, 1807-1823, bibliogr., summ., fig., excerpt.,
31. Długosz R, Kubiak K, TalaŔka T, Zbierska-Piątek 1, Parallel matrix multiplication circuits for use in kalman filtering, Facta Universitatis. Series: Electronics and Energetics, 2019, 32, 4, 479 - 501 , bibliogr., summ., tab., fig., doi: 10.2298'FUEE1904479D
32. Nikolić T, Talaśka T, Nikolić G, Długosz R., Performance Evaluation Of Bloek-Based Adaptive Algorithms, In: 31st International Conference on Microelectronics (MIEL): IEEE. 2019, 285-288 : bibliogr., summ., excl., fig.

**List of patents and protective works:**

1. Programmable logic gate performing OR and logic functions. Patent pending: PL20160419875 20161219.PL419875 (A1) Date of publication in the Bulletin of the Patent Office of the Republic of Poland: 02.07.2018,

**List of active participation in conferences:**

1. Mixed Design of Integrated Circuits and Systems, Poland
2. International Conference on Microelectronics, MIEL, Nis Serbia
3. European Seminar on Computing, ESCO, Plzeň Czech Republic
4. International Conference on Signal Processing and Communication Systems, ICSPCS, (Poland, Australia)

**List of scholarships and scientific internships:**

1. Scholarship of the Minister of Science and Higher Education (MNiSW) for outstanding young scientists. 2010-2012
2. Scholarship of the Mayor of the City of Bydgoszcz for outstanding young scientists. 2012-2013
3. Scientific internship at Aptive Service Poland S.A. - Krakow. 2018-2019
4. Scientific internship at Delphi Poland S.A. - Krakow. 2017
5. Research stay at the IHP Industrial Institute (Innovations for High Performance Microelectronics, Frankfurt (Oder), Germany). The residency was part of the FNP's POMOST grant, 2016
6. Research internship – Canada – University of Alberta in Edmonton. 2008

**List of participation in scientific grants:**

1. Research project UMO-2019/33/B/ST6/00875 "Telecommunications approach to modeling cell metabolism" awarded within the National Science Centre. Participation – co-investigator, member of the research team.
2. POMOST project of the Foundation for Polish Science (investigator). The title of the project is: Development of Novel Ultra Low Power, Parallel Artificial Intelligence Circuits for the Application in Wireless Body Area Network Used in Medical Diagnostics. 2014-2015.
3. Supervisor grant - title: Research on Kohonen network implemented in the form of an integrated circuit. KBN - N515 039 32/3061 - main contractor - 2008

**Other important academic and professional achievements:**

1. Award of the Marshal of the Kuyavian-Pomeranian Voivodeship. Category: Science, Research and Technical Progress.
2. Team scientific award (first and second degree) of the Rector of UTP. 2006-2017
3. Individual scientific award of the Rector of UTP. 2011,2018,2019

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# CRITERION 3

# Qualifications of academic teachers or research staff conducting education at the doctoral school

## chemical engineering

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# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Justyna Miłek

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

MSc./Chemical Technology/1999
PhD/field of technical sciences/discipline of chemical engineering/2011
Hab./field of technical sciences/discipline of chemical engineering/2024

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**
Biomechanical engineering in sustainable development technologies

**The following lists refer to the last 5 years, with particular emphasis on achievements related to classes conducted at the Doctoral School of the Bydoszcz University of Technology.**

**List of doctoral dissertation supervisor functions:**
lack

**List of reviews in the procedure for scientific promotion:**
lack

**List of scientific publications:**

1. Tomczak W., Gryta M., Grubecki I., Miłek J., Biogas Production in AnMBRs via Treatment of Municipal and Domestic Wastewater: Opportunities and Fouling Mitigation Strategies, Applied Sciences (2023) (MEiN 100 pts IF 2021 =2.838).
2. Miłek J., TatarchukT., Modified magnetite nanoparticles synthesized CTAB and their application to immobilize trypsin. Biocatalysis and Agricultural Biotechnology 47 (2023) 102586 (MEiN 70 pts, IF 2021 =3.328).
3. Miłek J., Lamkiewicz J. The starch hydrolysis by α-amylase Bacillus spp.: an estimation of the optimum temperatures, the activation and deactivation energies. Journal of Thermal Analysis and Calorimetry (2022) 147, 14459-14466. DOI:10.1007/s10973-022-11738-1 (MEiN 100 pt. IF 4.755).
4. Miłek J. Recombinant endo-inulinases: Determination the activation, deactivation energies and optimum temperatures in inulin hydrolysis. Journal of Thermal Analysis and Calorimetry. (2023) 148, 859-866. DOI: 10.1007/s10973-022-11809-3 (MEiN 100 pts. IF 2021 =4.755).
5. Miłek J. Application of the new method to determine the activation energies and optimum temperatures of inulin hydrolysis by exo-inulinases *Aspergillus niger*. Journal of Thermal Analysis and Calorimetry (2022) 147, 1371–1377. DOI: 10.1007/s10973-020-10495-3 (MEiN 100 pts. IF 2021 =4.755).
6. Miłek J. The inulin hydrolysis by recombinant exo-inulinases: determination the optimum temperatures and activation energies. Journal of Thermal Analysis and Calorimetry (2022) 147, 8061–8067. DOI:10.1007/s10973-021-11086-6 (MEiN 100 pts. IF 2021 =4.755).

7. Miłek J.: Determination of activation energies and the optimum temperatures of hydrolysis of starch by α-amylase from porcine pancreas. *Molecules* 2021, 26, 4117 (MEiN 140 pts, IF 2020 =4.927).
8. Miłek J. The effect of pH on determination of the optimum temperatures and activation energies of hydrolysis of olive oil by lipase from porcine pancreas. *Acta of Bioengineering and Biomechanics* 2021, 23(3), 1–15. (MEiN 100 pts, IF 2020 =1.238).
9. Miłek J. The effect of gum arabic on the values of estimated activation energies and optimum temperatures of olive oil hydrolysis by lipase by porcine pancreas. *Ecological Chemistry and Engineering S*, 2021, 28(3), 389-398 (MEiN 40 pts. IF 2020 =1.663).
10. Miłek J.: Determination the optimum temperature and activation energies for the hydrolysis of inulin hydrolysis by endo-inulinase *Aspergillus niger*. *Chemical and Process Engineering* 2020, 41 (2), 229–236 (MEiN 100 pt. IF 2019 =0.485).
11. Miłek J. Determination the optimum temperature and activation energies for the hydrolysis of p-nitrophenyl palmitate catalyzed by lipases. Chemical Industry 2021, 100, 103-104. DOI: 10.15199/62.2021.1.14. (MEiN70 ptsIF 2019 =0.490).
12. Miłek J. Thermal deactivation of *Saccharomyces cerevisiae* catalase. Chemical Industry 2020;99(3):585–587. DOI:10.15199/62.2020.4.14.(Ministry of Science and Higher Education 70 points IF 2019 =0.490).
13. Miłek J. Calculation of temperature optimum as well as activation and deactivation energy for the olive oil hydrolysis with porcine pancreas lipase. Przemysł Chemiczne 2020, 99(4), 446–448. DOI: 10.15199/62.2020.3.17 (Ministry of Science and Higher Education 70 pts, IF 2019 =0.485).
14. Miłek J.: Determination the optimum temperature and activation energies for the hydrolysis of starch by α-amylase *Bacillus licheniformis*. Przemysł Chemiczne 2020, 99, 880–881. DOI: 10.15199/62.2020.6.9. (Ministry of Science and Higher Education 70 points IF 2019 =0.485).
15. Miłek J.: Thermodynamics and kinetics of thermal deactivation of catalase *Aspergillus niger*. Polish Journal of Chemical Technology 2020; 22(2), 67–72. DOI: 10.2478/pjct-2020-0018. (Ministry of Science and Higher Education 70 points IF 2019 =1.125).
16. Miłek J., Kwiatkowska-Marks S., Trawczyńska I. 2018, Application of modified silica gel in the process of trypsin immobilization. Technical Sciences, 2019,22,1,35-43 (MNiSW 40 points)
17. Kwiatkowska-Marks S., Miłek J., Trawczyńska I.: Diffusion of Cd(II), Pb(II) and Zn(II) on calcium alginate beads. Technical Sciences, 2019,22,1,19-34. (MNiSW40 points).
18. Kwiatkowska-Marks S., Miłek J., Diffusive properties of alginate biosorbents, Ecological Chemistry and Engineering S, 2019,26,1,149-163 (MNiSW 40 pts. IF 2018 =1.488).
19. Trawczyńska I., Miłek J., Kwiatkowska-Marks S. 2018. *Effect of temperature, concentration of alcohols and time on backer's yeast permeabilization process.* Technical Sciences. 21, 3, 195–206 (Ministry of Science and Higher Education 11 pt. part B ).
20. J. Miłek, 2018.Estimation of the kinetic parameters for H2O2 enzymatic decomposition and for catalase deactivation. *Brazilian Journal of Chemical* Engineering,35, 3, 995–1004 (MNiSW25 pt. IF 2018 =0.790).

**List of patents and protection rights:**
lack

**List of active participation in conferences:**

Lectures:

1. Miłek J., *Method for determining the activation and deactivation energy of bioprocesses using an enzymatic membrane*, VIII ENZYMOS Scientific Conference "Enzymes in industrial science" (Tygiel Foundation), on-line lecture22 September 2022
2. Miłek J., *Determination of the activation and deactivation energy of an enzymatic reaction,* VIII National Scientific Conference "e-Factory of Science" (Promavendi Foundation), lecture 1 (on-line) November 19, 2022
3. Miłek J., *Determination of activation and deactivation energy for phenol decomposition reactions by immobilized horseradish peroxidase,* VIII National Scientific Conference "e-Factory of Science" (Promavendi Foundation), lecture 2 (on-line) November 19, 2022
4. MiłekJ., *Comparison of two methods to determine the deactivation energy of enzymes,* National Scientific Conference "Knowledge – Key to Success" – VII edition (Promavendi Foundation), lecture (on-line)21 January 2023

Poster presentations:

1. Kwiatkowska-Marks S., Miłek J., Trawczyńska I. *Diffusion of Cd, Pb and Zn in alginate granules.*2nd Workshop on Porous Media, Olsztyn, Poland 28-30 June 2018
2. Miłek J., Kwiatkowska-Marks S.: Trawczyńska I. *Application of silica gel in the process of trypsin immobilization.* 2nd Workshop on Porous Media, Olsztyn, Poland 28-30 June 2018
3. Miłek J., *Immobilization of trypsin on modified magnetic nanoparticles.*23rd Polish Conference of Chemical and Process Engineering, Warsaw-Jachranka, Poland, June 2-5, 2019
4. Miłek J., *The energies of activation and deactivation of 2,4-dichlorophenol decomposition by horseradish peroxidase immobilized on the modified nanofibrousmembrane.*XVI Summer School of Membrane "Membranes and membrane processes in theory and practice", Szczecin, Poland 20-22 July 2022
5. Miłek J., *The deactivation energies of inulin hydrolysis by inulinases.*24th Polish Conference of Chemical and Process Engineering, Szczecin, Poland June 13-16, 2023
6. Trawczyńska I., Miłek J., Kwiatkowska-Marks S. *Effect of temperature, alcohol concentration and process duration on the permeabilization of baker's yeast cells.*2nd Workshop on Porous Media, Olsztyn, Poland 28-30 June 2018

**List of scholarships and scientific internships:**

Institution: V International Scientific Internship "Nobel Laureates: A Study of Professional Experience and Achievement for Shaping a Successful Personality and Transforming the World Around Us" in Dubai, Oslo, Stockholm, Rome, Burgas, New York, Jerusalem and Beijing
Location: online in English
Deadline: from 24 June 2022 to 20 August 2022
Duration: 3months
Nature of the internship: Internship participant

**List of participation in scientific grants:**

Miniatura VII (2023) (ID 588709) Deactivation of α–amylase in honeys from different regions of Polish – in the evaluation

**Other important academic and professional achievements:**

Awards

26.08.2019 Award of the Rector of the University of Technology and Life Sciences in Bydgoszcz for scientific achievements in the second quarter of 2019

20.07.2020 Award of the Rector of the University of Technology and Life Sciences in Bydgoszcz for scientific achievements in the first half of 2020

5.10.2022 Medal of the National Education Commission for achievements in the field of didactic work.

8.11.2022 Award of the Rector of Bydgoszcz University of Technology for outstanding scientific achievements in 2021

Participation in an international program

The Baltic University Programme list of BUP Supervisor colleagium from 2022-09-14

Participation in the project "Didactic excellence of universities" implemented under the OP Knowledge Education Development 2014-2020 co-financed by the ESF under Priority Axis III; Measure 3.4 implemented by the Ministry of Education and Science (Agreement No. MEiN/2022/DIR/2551) project number POWR.03.04.00-00-P023/21. Project implementation period: 01.07.2022 – 30.09.2023. Function: project participant.

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# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Katarzyna Skórczewska

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

MSc./Chemical Technology/2007
PhD/Field of technical sciences/Discipline of materials engineering/2016

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**
Modern methods of testing polymer materials

**The following lists refer to the last 5 years, with particular emphasis on achievements related to classes conducted at the Doctoral School of the Bydgoszcz University of Technology.**

**List of doctoral dissertation supervisor functions:**

1. Assistant supervisor in the doctoral dissertation of Sławomir Wilczewski, MSc. Eng.: The influence of modified graphene on the structure and properties of nanocomposites based on poly(vinyl chloride)
2. Assistant supervisor/supervisor in the dissertation of Marcin Głowacki, M.Sc., Eng.: Assessment of the impact of environmental factors on the structure and mechanical properties of polymer elements manufactured by additive manufacturing techniques.

**List of reviews in the procedure for scientific promotion:**
lack

**List of scientific publications:**

1. Lewandowski, K.; Skórczewska, K.; Piszczek, K.; Urbaniak, W. Recycled glass fibres from wind turbines as a filler for poly(Vinyl chloride). Adv. Polym. Technol. 2019, 2019, 1–11, doi:10.1155/2019/8960503.
2. Matykiewicz, D.; Barczewski, M.; Mysiukiewicz, O.; Skórczewska, K. Comparison of Various Chemical Treatments Efficiency in Relation to the Properties of Flax , Hemp Fibers and Cotton trichomes to the Properties of Flax , Hemp Fibers and Cotton trichomes. J. Nat. Fibers 2019, 0, 1–17, doi:10.1080/15440478.2019.1645792.
3. Wilczewski, S.; Skórczewska, K.; Tomaszewska, J.; Lewandowski, K.; Szulc, J.; Runka, T. Manufacturing homogenous PVC/graphene nanocomposites using a novel dispersion agent. Polym. Test. 2020, 91, 106868, doi:10.1016/j.polymertesting.2020.106868.
4. Hejna, A.; Barczewski, M.; Skórczewska, K.; Szulc, J.; Khmelnytsky, B.; Korol, J.; Formela, K.; Sustainable upcycling of brewers' spent grain by thermo-mechanical treatment in twin-screw extruder. Clean. Prod. 2020, 124839, doi:10.1016/j.jclepro.2020.124839.
5. Andrzejewski, J.; Skórczewska, K.; Kloziński, A. Improving the Toughness and Thermal Resistance of Polyoxymethylene/Poly (lactic acid) Blends: Evaluation of Structure – Properties Correlation forReactive Processing. Polymers 2020, 12, 307, doi:10.3390/polym12020307.

6. Wilczewski, S.; Skórczewska, K.; Tomaszewska, J.; Lewandowski, K. Structure and properties of poly(vinyl chloride)/graphene nanocomposites. Polym. Test. 2020, 81, 106282, doi:10.1016/j.polymertesting.2019.106282.
7. Lewandowski, K.; Skórczewska, K. A Brief Review of Poly(Vinyl Chloride) (PVC) Recycling. Polymers 2022, 14, 3035, https://doi.org/10.3390/polym14153035.
8. Skórczewska, K.; Lewandowski, K.; Wilczewski, S. Novel Composites of Poly (vinyl chloride) with Carbon Fibre/Carbon Nanotube Hybrid Filler. Materials 2022, 15, 5625. https://doi.org/10.3390/ma15165625.
9. Zdanowicz, M.; Sałasińska, K.; Lewandowski, K.; Skórczewska, K. Thermoplastic Starch/Ternary Deep Eutectic Solvent/Lignin Materials: Study of Physicochemical Properties and Fire Behavior. Sustain. Chem. Eng. 2022, 10, 4579–4587, doi:10.1021/acssuschemeng.1c08542.
10. Matykiewicz, D.; Skórczewska, K. Characteristics and Application of Eugenol in the Production of Epoxy and Thermosetting Resin Composites: A Review. Materials 2022, 15, 4824.
11. Tomaszewska, J.; Wieczorek, M.; Skórczewska, K.; Klapiszewska, I.; Lewandowski, K.; Klapiszewski, Ł. Preparation, Characterization and Tailoring Properties of Poly(Vinyl Chloride) Composites with the Addition of Functional Halloysite–Lignin Hybrid Materials. Materials 2022, 15, 8102. https://doi.org/10.3390/ma15228102.
12. Wilczewski, S.; Skórczewska, K.; Tomaszewska, J.; Lewandowski, K.; Studziński, W.; Osial, M.; Jenczyk, P.; Crested Man, H.; Domańska, A. Curcuma longa L. Rhizome Extract as a Poly(vinyl chloride)/Graphene Nanocomposite Green Modifier. Molecules 2022, 27, 8081. https://doi.org/10.3390/molecules27228081.
13. Hejna, A.; Kosmela, P.; Olszewski, A.; Zedler, Ł.; Formela, K.; Skórczewska, K.; Piasecki, A.; Marć, M.; Barczewski, R.; Barczewski, M. Management of ground tire rubber waste by incorporation into polyurethane-based composite foams. Environ. Sci. Pollut. Res. 2023. https://doi.org/10.1007/s11356-023-25387-w
14. Skórczewska, K.; Szulc, J.; Lewandowski, K.; Ligocka, A.; Wilczewski, S. Modification of Poly(vinyl chloride) with Bio-Based Cassia Oil to Improve Thermo-Mechanical and Antimicrobial Properties. Materials 2023, 16, 2698. https://doi.org/10.3390/ma16072698

**List of patents and protection rights:**

1. PL242861 (B1) - A method for obtaining poly(vinyl chloride)/graphene nanocomposites with increased nanofiller dispersibility
2. PL237250 (B1) - A new polymer composite based on poly(vinyl chloride) and a method for its production
3. PL230971 (B1) - Method of obtaining poly(vinyl chloride)/inorganic oxide-lignin material
4. PL232195 (B1) - Silica fibre and the method of obtaining silica fibres
5. PL232744 (B1) - Silica fibre and the method of its preparation
6. PL231435 (B1) – Insulating mat and how to obtain it

**List of active participation in conferences:**

1. Skórczewska Katarzyna, Lewandowski Krzysztof, Wilczewski Sławomir, Tomaszewska Jolanta.
   Title: Manufacturing and structure of poly(vinyl chloride) composites with a hybrid carbon filler carbon fibers/ carbon nanotubes
   Title: In: The International Conference Simulations of Functional Materials (SFM 22)
   Conference/convention - place and date: Poznań : 20-22.01.2022
2. Skórczewska Katarzyna, Lewandowski Krzysztof, Szulc Joanna, Stopa Paulina, Barczewski Mateusz, Szewczykowski Piotr Przemysław, Piszczek Kazimierz Wojciech.
   Title: Waste eggshells as a natural filler for poly(vinyl chloride) modification
   Title: In: XXII Professorial Scientific Workshops on Polymer Plastics Processing

Conference/convention - place and date: Nowy Adamów : 30.06-02.07.2019

3. Authors: Wilczewski Sławomir, Skórczewska Katarzyna, Tomaszewska Jolanta, Lewandowski Krzysztof.
   Title: Structure and selected properties of poly(vinyl chloride) nanocomposites with graphene
   Parallel title: Structure and selected properties of poly(vinyl chloride)nanocomposites with graphene
   Title: In: XVIII Scientific and Technical Conference on Structural Polymers and Composites
   Conference/convention - place and date: Szczyrk : 24-27.09.2019
4. Skórczewska Katarzyna, Wilczewski Sławomir, Lewandowski Krzysztof.
   Title: Fabrication and properties of PLA composites containing a hybrid carbon filler: carbon fiber – carbon nanotubes
   Parallel title: Production and properties of PLA composites with hybrid carbon filler: carbon fiber - carbon nanotubes
   Title: In: XVIII Scientific and Technical Conference on Structural Polymers and Composites
   Conference/convention - place and date: Szczyrk : 24-27.09.2019

**List of scholarships and scientific internships:**
lack

**List of participation in scientific grants:**

1. NCBIR POIR.01.01.01-00-0558/15-00. 01.12.2015 - 31.10.2017.
   Development of a significantly improved product – an innovative smooth pipe for feed conveyors.
   Role in the project - contractor
2. NCBIR POIR.01.01.01-00-0045/17, 01.10.2017 - 31.03.2020.
   Development of a technology for the production of hybrid biodegradable composites for the automotive industry BioMoto
   Role in the project – main contractor
3. LIDER/25/0148/L-8/16/NCBR/2017. 01.01.2018 - 31.12.2020
4. NCN Miniatura 4 research project: Polymer composites with a hybrid carbon filler - structural and properties studies.
   Role in the project – manager, main contractor
   2020/04/X/ST5/01684. 10.12.2020 - 10.12.2021

**Other important academic and professional achievements:**
lack

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Katarzyna Witt

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

MSc./Chemical Technology/2008
PhD/Field of Chemical Sciences/discipline Chemistry/2016
Hab./Field of technical sciences/discipline of Chemical engineering/2025

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**
Modern methods of metal removal in industry and the environment

**The following lists refer to the last 5 years, with particular emphasis on achievements related to classes conducted at the Doctoral School of the Bydgoszcz University of Technology.**

**List of doctoral dissertation supervisor functions:**

1. Assistant supervisor in the doctoral dissertation of Kamil Ziuziakowski, M.Sc., Eng., entitled "Technologies for wastewater treatment from galvanic processes. New methods of process water treatment in closed water circulation systems in electroplating" (2023). PhD thesis carried out as part of the program "Implementation Doctorate" of the Ministry of Science and Higher Education No. 57/DW/2012/01/1 in the years 2017-2022
2. Assistant supervisor in the doctoral dissertation of Daria Bożejewicz, MSc, Eng., entitled "Application of selected ligands in separation processes (solvent extraction, transport of metal ions through polymer inclusion membranes, adsorption) for the removal of d-electron metals from aqueous solutions".

**List of reviews in the procedure for scientific promotion:**
lack

**List of scientific publications:**

1. Radzyminska-Lenarcik E., Witt K. 2019. Sorption of Cu(II), Zn(II) and Pb(II) Ions in an Aqueous Solution on the PVC-Acetylacetone Composites. Polymers 11(3), 513, 1-12. https://doi.org/10.3390/polym11030513
2. Makarewicz E., Tworek M., Mroczyńska K., Witt K., Shyychuk I. 2019. Properties of cadmium pigments after chemical exposure and UV irradiation, Właściwości pigmentów kadmowych po narażeniach chemicznych i naświetlaniu promieniowaniem UV. Przemysł Chemiczny 98(5), 734-741. DOI: 10.15199/62.2019.5.7
3. Witt K., Radzyminska-Lenarcik E. 2019. Characterization of PVC-based polymer inclusion membranes with phosphonium ionic liquids. Journal of Thermal Analysis and Calorimetry, 138 (6), 4437–4443. DOI :10.1007/s10973-019-08912-3
4. Bożejewicz D., Witt K., Kaczorowska M.A., Ośmiałowski B. 2019. The Copper(II) Ions Solvent Extraction with a New Compound: 2,6-Bis(4-Methoxybenzoyl)-Diaminopyridine, Processes 7(12), 954; 1-11, https://doi.org/10.3390/pr7120954

5. Witt K., Radzyminska-Lenarcik E. 2020. Study on effectiveness of PVC/β-diketone sorbent in removing residue of Zn(II), Cr(III) and Ni(II) from post-galvanic wastewater. Desalination and Water Treatment 186, 199–205. doi: 10.5004/dwt.2020.25121
6. Radzyminska-Lenarcik E., Witt K. 2020. The application of acetylacetone for the separation of heavy metals in roadside soil belts by extraction methods. Desalination and Water Treatment 186, 191–198. doi: 10.5004/dwt.2020.25120
7. Witt K., Bożejewicz D., Kaczorowska M.A. 2020. N,N'-Bis(salicylidene)ethylenediamine (Salen) as an Active Compound for the Recovery of Ni(II), Cu(II), and Zn(II) Ions from Aqueous Solutions. Membranes 10, 60, 1-15. doi:10.3390/membranes10040060
8. Bożejewicz D., Ośmiałowski B., Kaczorowska M.A., Witt K. 2021. 2,6-Bis((benzoyl-R)amino)pyridine (R = H, 4-Me, and 4-$NMe_2$) Derivatives for the Removal of Cu(II), Ni(II), Co(II), and Zn(II) Ions from Aqueous Solutions in Classic Solvent Extraction and a Membrane Extraction. Membranes, 11, 233, 1-19. DOI: 10.3390/membranes11040233
9. Bożejewicz D., Witt K., Kaczorowska M.A. 2021. The comparison of the removal of copper(II) and zinc(II) ions from aqueous solution using 2,6-diaminopyridine in a polymer inclusion membrane and in a classic solvent extraction. Desalination and Water Treatment 214, 194-202. DOI: https://doi.org/10.5004/dwt.2021.26659
10. Witt K., Urbaniak W., Kaczorowska M.A., Bożejewicz D. 2021. Simultaneous Recovery of Precious and Heavy Metal Ions from Waste Electrical and Electronic Equipment (WEEE) Using Polymer Films Containing Cyphos IL 101. Polymers 13, 1454, 1-18. DOI: 10.3390/polym13091454
11. Bożejewicz D., Witt K., Kaczorowska M.A., Urbaniak W., Ośmiałowski B. 2021. The Application of 2,6-Bis(4-Methoxybenzoyl)-Diaminopyridine in Solvent Extraction and Polymer Membrane Separation for the Recovery of Au(III), Ag(I), Pd(II) and Pt(II) Ions from Aqueous Solutions. International Journal of Molecular Science 22, 9123, 1-15. https://doi.org/10.3390/ijms22179123
12. Witt K., Kaczorowska M.A., Bożejewicz D., Urbaniak W. 2021. Efficient recovery of noble metal ions ($Pd^{2+}$, $Ag^{+}$, $Pt^{2+}$ and $Au^{3+}$) from aqueous solutions using N,N'-bis(salicylidene)ethylenediamine (salen) as an extractant (classic solvent extraction) and carrier (polymer membranes). Membranes 11(11), 863, 1-22. https://doi.org/10.3390/membranes11110863
13. Bożejewicz D., Kaczorowska M. A., Witt K. 2022. Recent advances in the recovery of precious metals (Au, Ag, Pd) from acidic and WEEE solutions by solvent extraction and polymer inclusion membrane processes - a mini-review. Desalination and Water Treatment 246, 12-24. DOI: 10.5004/dwt.2022.27862
14. Kaczorowska M.A., Bożejewicz D., Witt K., Urbaniak W. 2022. New application of 2-benzoylpyridine – efficient removal of silver ions from acidic aqueous solutions in adsorptive membrane processes and classic solvent extraction. Chemical and Process Engineering 2022, 43 (3), 369–382, DOI: 10.24425/cpe.2022.142280
15. Witt K., Studziński W., Bożejewicz D. 2023. Possibility of New Active Substrates (ASs) to Be Used to Prevent the Migration of Heavy Metals to the Soil and Water Environments. Molecules, 28(1), 94, 1-14. https://doi.org/10.3390/molecules28010094
16. Kaczorowska M.A., Bożejewicz D., Witt K. 2023. The Application of Polymer Inclusion Membranes for the Removal of Emerging Contaminants and Synthetic Dyes from Aqueous Solutions—A Mini Review. Membranes, 13, 132. 1-22. https://doi.org/10.3390/membranes13020132

**List of patents and protection rights:**

1. Skotnicki T., Kazimierska A., Ziuziakowski K., Witt K., Urbaniak W., Radzymińska-Lenarcik E., Skórczewska K., Lewandowski K. Nowy kompozyt polimerowy na bazie polichlorku winylu i sposób jego otrzymywania. Polski patent PL 237250 (2020). Polskie zgłoszenie patentowe P.425352 (2018).

2. Skotnicki T., Kazimierska A., Ziuziakowski K., Witt K., Urbaniak W., Radzymińska-Lenarcik E. Sposób usuwania jonów metali ciężkich z roztworów amoniakalnych, zwłaszcza ścieków. Polski patent PL 237288 (2019). Polskie zgłoszenie patentowe P.425353 (2018).
3. Wasilewska A., Witt K., Radzymińska-Lenarcik E., Urbaniak W. Azowy kompleks barwiący typu 1:2 oraz sposób jego wytwarzania. Polski patent PL 231365 (2019). Polskie zgłoszenie patentowe P.414085 (2015).
4. Witt K., Radzymińska-Lenarcik E., Eitner K., Urbaniak W. Polimerowa membrana inkluzyjna oraz sposób jej otrzymywania. Polski patent PL 231714 (2019). Polskie zgłoszenie patentowe P. 411839 (2015). Europejskie zgłoszenie patentowe EP3277413 (A1), WO 2016/159801.
5. Wasilewska A., Maćkowska E., Witt K., Urbaniak W. Sposób oczyszczania barwników zawierających związek barwny w postaci metalokompleksów typu 1:2 z grupami sulfonowymi. Polski patent PL 237687 (2021). Polskie zgłoszenie patentowe P.405600 (2013).
6. Bożejewicz D., Witt K., Ośmiałowski B., Kaczorowska M. Sposób odzyskiwania miedzi(II) z kwaśnych roztworów , zwłaszcza odpadowych i potrawiennych. Polski patent PL 240363 (2022). Polskie zgłoszenie patentowe P.431208 (2019).
7. Bożejewicz D., Witt K., Ośmiałowski B., Kaczorowska M. Sposób odzyskiwania jonów miedzi(II), niklu(II), kobaltu(II) i cynku(II) z wodnych roztworów. Polski patent PL 242122 (2023). Polskie zgłoszenie patentowe P.436670 / WIPO ST 10/C PL436670 (2021).
8. Witt K., Bożejewicz D., Studziński W., Lelewer K., Belka K. Aktywne podłoże zapobiegające migracji metali ciężkich, zwłaszcza do środowiska gruntowowodnego, sposób jego otrzymywania oraz jego zastosowanie. Polskie zgłoszenie patentowe P.442582 / [WIPO ST 10/C PL442582] (2022).
9. Witt K. Nowa pochodna β-ketoiminy, sposób jej otrzymywania oraz jej zastosowanie. Polskie zgłoszenie patentowe P.442807 / [WIPO ST 10/C PL442807] (2022).

**List of active participation in conferences:**

Messages:

1. Radzymińska-Lenarcik E., Witt K. 2019. Badanie zawartości cynku oraz kadmu w próbkach gleb z okolic Bydgoszczy. XIV Konferencja Naukowa Mikrozanieczyszczenia w środowisku człowieka, Częstochowa, 124.
2. Witt K., Radzymińska-Lenarcik E. 2019. Usuwanie jonów metali ciężkich ze ścieków pogalwanicznych w końcowym etapie oczyszczania. XIV Konferencja Naukowa Mikrozanieczyszczenia w środowisku człowieka, Częstochowa, 158.
3. Kaczorowska M.A., Bożejewicz D., Witt K. 2019. Analiza budowy flawonoidów oraz ich kompleksów z jonami metali przejściowych za pomocą metod spektrometrii mas. VII Ogólnopolska Konferencja Naukowa Nauka niejedno ma imię... / mgr Michał Górecki, mgr Patrycja Fereni-Morzyńska, Bydgoszcz, 37.
4. Bożejewicz D., Witt K., Kaczorowska M.A., 2019. Przegląd nośników stosowanych w polimerowych membranach inkluzyjnych do odzysku jonów metali nieżelaznych. VII Ogólnopolska Konferencja Naukowa Nauka niejedno ma imię... / mgr Michał Górecki, mgr Patrycja Fereni-Morzyńska, Bydgoszcz, 18.
5. Radzymińska-Lenarcik E., Witt K., Urbaniak W. 2019. Separacja i odzysk metali z elektroodpadów. Praktyczne aspekty Remediacji, Rekultywacji i Rewitalizacji, Kołobrzeg.
6. Bożejewicz D., Witt K., Kaczorowska M.A. 2021. The comparison of separation of copper(II) ions (solvent extraction and polymer inclusion membrane) from the aqueous solutions using a 2,6-diaminopyridine. 13th Scientific Conference „Membranes and Membrane Processes in Environmental Protection", MEMPEP 2021, 62-63.
7. Witt K., Bożejewicz D., Kaczorowska M.A. 2021.The influence of chemical structure of carrier molecules on metal ions transport across polymer inclusion membranes, 13th Scientific Conference „Membranes and Membrane Processes in Environmental Protection", MEMPEP 2021, 136-137.

8. Bożejewicz D., Ośmiałowski B., Kaczorowska M.A., Witt K. 2021. The use of 2,6-bis((benzoyl-R)amino)pyridine (R=H, 4-Me, and 4-$NMe_2$) derivatives as effective compounds for the removal of Cu(II), Ni(II), Co(II) and Zn(II) ions from aqueous solutions by membrane extraction processes and classical solvent extraction, 13th Scientific Conference „Membranes and Membrane Processes in Environmental Protection", MEMPEP 2021, 138-139.
9. Bożejewicz D., Kaczorowska M.A., Witt K. 2021. Recent advances in the recovery of precious metals (Au, Ag, Pd) from acidic and WEEE solutions by solvent extraction and polymer inclusion membrane processes – a mini-review, 13th Scientific Conference „Membranes and Membrane Processes in Environmental Protection", MEMPEP 2021, 140-141.
10. Witt K. 2022. Methods of reduction of heavy metals contamination in water and soil. Proceedings of the IV International Scientific-Practical Conference Water Supply and Wastewater Disposal: Designing, Construction, operation and Monitoring, 196.
11. Witt K. 2022. Dobór czynnika ługującego do odzysku cynku z osadu powstałego po oczyszczaniu ścieków pochodzących z galwanizerni. „Nauka i przemysł – metody spektroskopowe w praktyce, nowe wyzwania i możliwości", Lublin.
12. Witt K., Bożejewicz D., Studziński W. 2022. Ochrona środowiska naturalnego przed skażeniem szkodliwymi metalami/Protection of the natural environment against contamination with harmful metals. IV Ogólnopolska Przyrodnicza Konferencja Naukowa „Mater naturae" – osiągnięcia, wyzwania i problemy nauk przyrodniczych. Fundacja na rzecz promocji nauki i rozwoju TYGIEL, Lublin, ISBN 978-83-67194-94-5, 49-50.
13. Bożejewicz D., Witt K., Belka K. 2022. Zastosowanie cieczy jonowych do usunięcia jonów metali ciężkich z wodnych roztworów/Application of ionic liquids to remove heavy metal ions from aqueous solutions. IV Ogólnopolska Przyrodnicza Konferencja Naukowa „Mater naturae" – osiągnięcia, wyzwania i problemy nauk przyrodniczych. Fundacja na rzecz promocji nauki i rozwoju TYGIEL, Lublin, ISBN 978-83-67194-94-5, 55-56.

Papers:

1. Witt K., Radzymińska-Lenarcik E., Urbaniak W. 2019. Separacja i odzysk metali ze ścieków pogalwanicznych. Praktyczne aspekty Remediacji, Rekultywacji i Rewitalizacji, Kołobrzeg
2. Witt K. 2021. Methods of reduction of heavy metals contamination in water and soil. IV International scientific-practical conference water supply and wastewater disposal: designing, construction, operation and monitoring, Lviv
3. Witt K. 2022. Dobór czynnika ługującego do odzysku cynku z osadu powstałego po oczyszczaniu ścieków pochodzących z galwanizerni. „Nauka i przemysł – metody spektroskopowe w praktyce, nowe wyzwania i możliwości", Lublin.
4. Witt K. 2022. Recykling cennych metali ze źródeł wtórnych, XII Seminarium Interdyscyplinarne PBŚ, Bydgoszcz.

**List of scholarships and scientific internships:**

1. Wyjazd w ramach programu ERASMUS+ w celu prowadzenia zajęć dydaktycznych (8h), University of Huelva, 18-22.12.2019
2. Wyjazd w ramach programu ERASMUS+ w celu prowadzenia zajęć dydaktycznych (8h), University of Coimbra, 8-12.05.2023

**List of participation in scientific grants:**

Member of the scientific team of the grant for pre-implementation works No. 2/1/2011 entitled "Development of innovative polymer active mats used to prevent contamination of the water and soil environment with heavy metals". The grant is implemented at the Faculty of Technology and Chemical Engineering of the Bydgoszcz University of Technology in Bydgoszcz as part of the Innovation Incubator 4.0 program, co-financed by the European Union. Project manager: Waldemar Studziński, PhD, Eng.

**Other important academic and professional achievements:**

Medals:

1. Gold medal at the KIDE 2020 International Invention and Design Fair in Kaohsiung, Taiwan (10-12.12.2020) for the team working on the invention "Polymer inclusion membrane and a method of obtaining it", Witt K., Radzymińska-Lenarcik E., Eitner K., Urbaniak W.
2. WIIPA SPECIAL AWARD at the KIDE 2020 International Invention and Design Fair in Kaohsiung, Taiwan (10-12.12.2020) for the team working on the invention "Polymer inclusion membrane and a method for its preparation", Witt K., Radzymińska-Lenarcik E., Eitner K., Urbaniak W.
3. Silver medal at the KIDE 2020 International Invention and Design Fair in Kaohsiung, Taiwan (10-12.12.2020) for the team working on the invention "Method of recovering copper(II) from acidic solutions, especially waste and dish solutions", Bożejewicz D., Witt K., Ośmiałowski B., Kaczorowska M.
4. Medal of the National Education Commission, Ministry of Education and Science, ID card No. 175598, 2021.
5. Gold medal at the E-nnovate International Innovation Show in Bydgoszcz (8-10.06.2022) for the team working on the invention "Method of recovering copper(II) from acidic solutions, especially waste and dish solutions", Bożejewicz D., Witt K., Ośmiałowski B., Kaczorowska M.
6. Srebrny medal na International Invention and Technology Exhibition w Bydgoszczy (20-21.10.2022) dla zespołu pracującego nad wynalazkiem "Innovative polymer active mats used to prevent contamination of the water-soil environment with heavy metals", Studziński W., Witt K., Bożejewicz D., Lelewer K., Belka K.
7. Distinction in the Innovation Leaders of Pomerania and Kujawy 2022 competition for the Research Team of the Faculty of Agriculture and Technology of the Bydgoszcz University of Technology for the solution entitled "Innovative polymer active mats used to prevent contamination of the water and soil environment with heavy metals" Studziński W., Witt K., Bożejewicz D. (8.11.2022).
8. Gold medal for the invention: Active substrate (AS) used to prevent the migration of heavy metals to the soil and water environment, Polish patent application P. 442582 (2022), Katarzyna Witt, Daria Bożejewicz, Waldemar Studziński, Karolina Lelewer, Katarzyna Belka
9. Gold medal for the invention: A method of recovering copper(II) from acidic solutions, especially from waste and digestive solutions, POLISH PATENT NO. PL 240363 (2022), Bożejewicz Daria, Witt Katarzyna, Ośmiałowski Borys, Kaczorowska Małgorzata
10. Silver medal for the invention: A method of recovering copper(II), nickel(II), cobalt(II) and zinc(II) ions from aqueous Solutions, POLISH PATENT NO. PL 242122 (2023),Bożejewicz Daria, Witt Katarzyna, Ośmiałowski Borys, Kaczorowska Małgorzata
11. Gold medal for the invention: A new derivative of β-ketoimine, the method of its preparation and its application. Polish patent application no. P.442807 (2022), Katarzyna Witt

Cooperation with industry:

1. established cooperation "science-industry" with Przedsiębiorstwo Wielobranż GALKOR Sp. z o.o. in Koronowo in the field of conducting scientific and research consultations and research in the field of the use of polymer inclusion membranes for the treatment of post-galvanic wastewater (agreement from 31.03.2017),
2. established cooperation "science-industry" with Przedsiębiorstwo Produkcyjno-Handlowo-Usługowe UT-OIL Sp. z o.o. in Dzierzgoń in the field of development of a wastewater neutralization process as part of the alkaline galvanizing process (contribution to the report) (agreement from 02.01.2020 - 31.12.2020)

Functions performed:

1. Chairwoman of the Organizing Committee of the 250. Anniversary of the birth of Jędrzej Śniadecki at the University of Technology in Bydgoszcz, 2018 (Inaugural lecture by Dr. Emilia

M. Iwaszkiewicz from the University of Vilnius together with the screening of a film about Jędrzej Śniadecki, Solemn 413. Senate of UTP with the participation of a delegation from Vilnius University, Science Festival).

2. Member of the Organizing Committee for the celebration of the 70th anniversary of UTP in Bydgoszcz, 2020-21, Z.101.2020.2021
3. Member of the Faculty Committee on Intellectual Property, since 2021, Z.186.2020.2021
4. Participation in the faculty recruitment committee of the University of Technology and Life Sciences in Bydgoszcz as deputy chairman (academic year 2017/2018) and as didactic secretary (academic years: 2017/2018, 2018/2019, 2019/2020, 2020/2021, 2021/2022 (Z.164.2020.2021), 2022/2023 (Z.164.2021.2011), 2023/2024 (Z.123.2022.2023)
5. Tutor of the year for students of Chemical Technology (since 2016).

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Waldemar Studzinski

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

MSc./Environmental Protection/2012
PhD/Exact and Natural Sciences/Discipline Chemical Sciences/2019

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**
New pollutants and their environmental effects

**The following lists refer to the last 5 years, with particular emphasis on achievements related to classes conducted at the Doctoral School of the Bydgoszcz University of Technology.**

**List of doctoral dissertation supervisor functions:**
lack

**List of reviews in the procedure for scientific promotion:**
lack

**List of scientific publications:**

1. S. Phuong Nguyen T., Wilczewski S., Lewandowski J., Majkowska-Pilip A., Żelechowska-Matysiak K., Nieciecka D., Studziński W., Olusegun Sunday J., Syczewski M., Giersig M., Thanh Dinh Thi M., Krysiński P., Osial M., 2023, 5-fluorouracil and curcuminoids extract from Curcuma longa L. loaded into nanohydroxyapatite as a drug delivery carrier for SKOV-3 and HepG2 cancer cells treatment, Ceramics International, 10.1016/j.ceramint.2023.05.123.
2. Studziński W., Przybyłek M., Gackowska A.2023, Application of gas chromatographic data and 2D molecular descriptors for accurate global mobility potential prediction, Environmental Pollution, 317, 120816, 1-13, 10.1016/j.envpol.2022.120816
3. K. Witt, W. Studziński, D. Bożejewicz, 2023, Possibility of New Active Substrates (ASs) to Be Used to Prevent the Migration of Heavy Metals to the Soil and Water Environments, Molecules, 28, 1, 94, 10.3390/molecules28010094
4. W. Studziński, M. Przybyłek, 2023, The Treatment of Pharmaceutical Wastewater : Innovative Technologies and the Adaptation of Treatment Systems / eds. Afzal Husain Khan, Nadeem A. Khan, Mu. Naushad, Hamidi Abdul, 179-216, p-ISBN: 978-0-323-99160-5
5. Wilczewski, K. Skórczewska, J. Tomaszewska, K. Lewandowski, W. Studziński, M. Osial, P. Jenczyk, H. Grzywacz, A. Domańska, 2022, Curcuma longa L. Rhizome Extract as a Poly(vinyl chloride)/Graphene Nanocomposite Green Modifier, Molecules 27(22), 8081; https://doi.org/10.3390/molecules27228081 IF 4.927,
6. P. Kosobucki, W. Studziński, S.. Zuo, 2022, The role of analytical chemistry in poultry science, Physical Sciences Reviews, https://doi.org/10.1515/psr-2021-0126,

7. Studziński W., Poćwiardowski W., Osińska W., Application of the Swimming Pool BackwashWater Recovery System with the Use of Filter Tubes, Molecules 2021, 26(21), 6620. IF-4.927.
8. Studzinski W. Gackowska A., Kudłek E., Determination of environmental properties and toxicity of octyl-1. dimethyl-para-aminobenzoic acid and its degradation products, J. Hazard Mater 403 (2021) 123856. IF= 9.038.
9. Gackowska A., Studziński W., 2020. Effect of Activated Sludge on the Degradation of 2-Ethylhexyl 4-2. Methoxycinnamate and 2-Ethylhexyl 4-(Dimethylamino)Benzoate in Wastewater. Water Air Soil Pollut 231, 158 (2020). IF= 1.963.
10. Przybyłek M., Studziński W., Gackowska A., Gaca J. 2019. The use of fast molecular descriptors and artificial neural networks approach in organochlorine compounds electron ionization mass spectra classification, Environmental Science and Pollution Research 26, 28188–28201. IF= 2.914.
11. Gackowska A., Studziński W., Kudlek E., Dudziak M., Gaca J. 2018. Estimation of physicochemical properties of 2-ethylhexyl-4-methoxycinnamate (EHMC) degradation products and their toxicological evaluation, Environmental Science and Pollution Research, 25, 16037–16049. IF=2,914.

**List of patents and protection rights:**

1. Application in the Patent Office of the Republic of Poland for the invention entitled "Active substrate preventing the migration of heavy metals, especially to the soil and water environment, method of its production and its application", P.442582, application accepted on October 19, 2022.

**List of active participation in conferences:**

1. I. Narloch, Ł. Dąbrowski, W. Studziński, Analysis of 2-phenylphenol transformations under the influence of tap water subjected to the electrolysis process, XI Polish Conference on Analytical Chemistry, Łódź, 19-23.06.22
2. A. Gackowska, W. Studziński, G. Wejnerowska, The influence of oxidizing agents and UV radiation on the degradation of salicylic acid, XI Polish Conference on Analytical Chemistry, Łódź, 19-23.06.22
3. A. Gackowska, W. Studziński, S. Dumin, The influence of pH and hydrogen peroxide concentration on the shelf life of aspirin solution irradiated with UV radiation, XI Polish Conference on Analytical Chemistry, Łódź, 19-23.06.22
4. W. Studziński, I. Narloch, Ł. Dąbrowski, Analysis of selected parameters of water subjected to electrolysis in a food purification device: at the conference I National Conference Food and Nutrition in a Nutshell, 9.04.22.
5. Ł. Dąbrowski, W. Studziński, I. Narloch, Analysis of pesticide degradation products in electrolysed water produced in food purification devices, SelectScience Virtual Analitycal Summit 2022, 15.02.22.
6. S. Zuo, E. Pietrzak, W. Studzinski , G. Gardiner, P. Lawlor., P. Kosobucki, K. Stadnicka.. Metabolic footprints of probiotic function in the chicken intestine, Book of Abstracts of the 73rd Annual Meeting of the European Federation of Animal Science, Porto, 5-9.09.2022.
7. W. Studziński, G. Wejnerowska, Protein separation from oilseed cakes as a possible use of a by-product of the food industry, Zero Waste Technologies Seminar, Bydgoszcz, 9.06.2022.
8. W. Studziński, A. Gackowska, M. Dadzibóg, Recovery of raw materials from waste generated in the production of cables over possibilites of their use, Zero Waste Technologies Seminar, Bydgoszcz, 9.06.2022.
9. Poćwardowski W., Studziński W., Osińska W., Application of the water recovery system from rinsing swimming pool filters in the nano-ultrafiltration process with the use of filter tubes, Swimming pool installations 29 September-1 October 2021, Ustroń.

10. Studziński W., Gackowska A., Advanced oxidation methods for the degradation of,lipophilic organic compounds in wastewater, IX Scientific Outgoing Session of PhD Students of Lodz University of Technology, 2019, Rogów.
11. Studziński W., Traczyk D., Gackowska A., 2-Phenylbenzimidazole-5-sulfonic acid and its degradation products as the new pollutants, VIII Scientific Outgoing Session of PhD Students of Lodz University of Technology, 2018, Rogów.
12. Studziński W., Gackowska A. Propagation and accumulation of micro-pollutants in environment, VIII Outgoing Scientific Session of PhD Students of Lodz University of Technology, 2018, Rogów.
13. Gackowska A., Studziński W., UV filters and their chloroorganic products as the environmental micro-pollutants, The 41st Symposium Chromatographic Methods of Investigating Organic Compounds 2018, Szczyrk.
14. Gackowska A., Studziński W., Kosobucki P., Application of oxidation processes to the removal of micropollutants from wastewater, 61st Scientific Congress of the Polish Chemical Society 2018, Kraków.
15. Studziński W., Gackowska A., Evaluation of the efficiency of degradation of p-dimethylaminobenzoic acid 2-ethylhexyl ester under the influence of oxidizing agents, VII International Scientific Conference "Environmental Engineering - Young Eye", 2018, Białystok.
16. Studziński W., Ozonation as an effective method of eliminating new organic pollutants from the water matrix, VI National Scientific Conference Science Has Many Names..., 2018, Bydgoszcz.

**List of scholarships and scientific internships:**

1. Scientific training in the preparation of environmental samples and analytical methods at the University of Cádiz (Universidad de Cadiz) – Spain 06.2022,
2. Internship at ASPRODUKT Sebastian Pasturek, based in Mała Nieszawka as part of the technology of water purification from the fruit and vegetable industry using the chlorine-free method, co-financed by the European Union under the Smart Growth Operational Programme (09.2021 – 11.2021),
3. Internship at ASPRODUKT Sebastian Pasturek, based in Mała Nieszawka as part of the project Creation of a Research and Development Center in the field of rinse water treatment technology, co-financed by the European Union under the Smart Growth Operational Program (04.2020 - 06.2020),
4. Scientific cooperation with Alpinus Chemia Sp. z o. o. in Solec Kujawski as part of research on the isolation of pyrazines from fusel oils using a centrifugal preparative chromatograph (08.2019 –10.2020).

**List of participation in scientific grants:**

1. Innovation Incubator 4.0, project title: Development of innovative polymer active mats used to prevent environmental contamination with water and soil heavy metals – principal investigator, 2021-2023.
2. Thumbnail 6, project title: Ecotoxicological assessment of selected micropollutants from the group of "emerging pollutants" in the aquatic environment under the influence of various oxidizing and chlorinating agents – Principal Investigator 2022-2023

**Other important academic and professional achievements:**

1. Gold award "Active substrate (AS) used to prevent the migration of heavy metals to the soil and water environment according to the Polish patent application P. 442582", International Invention and Technology Exhibition E-nnovate 2023, Bydgoszcz.

2. Silver award in category Green Economy: "Innovative polymer active mats used to prevent contamination of the water-soil environment with heavy metals", International Invention and Technology Exhibition Innoving 2022, Lublin.

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# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name**:
Virginia Tomczak

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

Hab./ Field of technical sciences/discipline of Chemical engineering/ 2023
PhD / technical sciences / chemical technology / 2014
MSc Eng. / Technical Physics / 2011
MSc Eng. / Chemical Technology / 2010

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**
Membrane bioreactors

**The following lists refer to the last 5 years, with particular emphasis on achievements related to classes conducted at the Doctoral School of the Bydgoszcz University of Technology.**

**List of doctoral dissertation supervisor functions:**
lack

**List of reviews in the procedure for scientific promotion:**
lack

**List of scientific publications:**

1. Tomczak W., Gryta M., Kowalczyk K., 2023. *The influence of storage time on the performance of polypropylene membranes applied for membrane distillation*. Separation and Purification Technology 308, 122881. DOI: 10.1016/j.seppur.2022.122881
2. Tomczak W., 2023. *Fouling of the nanofiltration membrane NF270 used for separation of fermentation broths: Impact of feed pretreatment process*. Processes, 11(3), 817. DOI: 10.3390/pr11030817
3. Tomczak W., Gryta M., 2023. *Long-term performance of ultrafiltration membranes: Corrosion fouling aspect*. Materials, 16(4), 1673. DOI: 10.3390/ma16041673
4. Tomczak W., Gryta M., 2023. *The application of polyethersulfone ultrafiltration membranes for separation of car wash wastewaters: Experiments and modelling*. Membranes 13(3), 321. DOI: 10.3390/membranes13030321
5. Tomczak W., Gryta M., Grubecki I., Miłek J., 2023. *Biogas production in AnMBRs via treatment of municipal and domestic wastewater: Opportunities and fouling mitigation strategies*. Applied Sciences 13(11), 6466. DOI: 10.3390/app13116466
6. Tomczak W. , Gryta M., 2022. *The application of cellulose acetate membranes for separation of fermentation broths by the reverse osmosis: A feasibility study*. International Journal of Molecular Sciences, 23(19), 11738. DOI: 10.3390/ijms231911738
7. Tomczak W., Gryta M., 2022. *Energy-efficient AnMBRs technology for treatment of wastewaters: A review*. Energies, 15(14), 4981. DOI: 10.3390/en15144981

8. Tomczak W., Gryta M., 2022. *The impact of operational parameters on polypropylene membrane performance during the separation of oily saline wastewaters by the membrane distillation process*. Membranes 12(4), 351. DOI: 10.3390/membranes12040351
9. Tomczak W., 2022. *The application of the nanofiltration membrane NF270 for separation of fermentation broths*. Membranes, 12(12), 1263. DOI: 10.3390/membranes12121263
10. Gryta M., Tomczak W., 2021. *Stability of Ar/$O_2$ plasma-treated polypropylene membranes applied for membrane distillation*. Membranes 11(7), 531. DOI: 10.3390/membranes11070531
11. Tomczak W., Gryta M., 2021. *Comparison of polypropylene and ceramic microfiltration membranes applied for separation of 1,3-PD fermentation broths and Saccharomyces cerevisiae yeast suspensions*. Membranes, 11(1), 44. DOI: 10.3390/Membranes11010044
12. Tomczak W., Gryta M., 2021. *Application of ultrafiltration ceramic membrane for separation of oily wastewater generated by maritime transportation*. Separation and Purification Technology, 261, 118259. DOI: https://doi.org/10.1016/j.seppur.2020.118259
13. Tomczak W., Grubecki I., Gryta M., 2021. The use of NaOH solutions for fouling control in a membrane bioreactor: A feasibility study. Membranes, 11(11), 887. DOI: 10.3390/membranes11110887
14. Tomczak W., Gryta M., 2021. *Membrane distillation of saline water contaminated with oil and surfactants*. Membranes, 11(12), 988. DOI: 10.3390/membranes1112098
15. Tomczak W., Gryta M., 2021. *Application of capillary polypropylene membranes for microfiltration of oily wastewaters: Experiments and modelling*. Fibers, 9(6), 35. DOI: 10.3390/fib9060035
16. Tomczak W., Gryta M., 2020. *Cross-flow microfiltration of glycerol fermentation broths with Citrobacter freundii*. Membranes 10(4), 67. DOI: 10.3390/membranes10040067
17. Tomczak W., Gryta M., 2020. *Clarification of 1,3-propanediol fermentation broths by using a ceramic fine UF membrane.* Membranes 10(11), 319. DOI:10.3390/membranes10110319
18. Tomczak W., Ferrasse J.-H, Giudici-Orticoni M.-T., Soric A., 2018. *Effect of hydraulic retention time on a continuous biohydrogen production in a packed bed biofilm reactor with recirculation flow of a liquid phase*. International Journal of Hydrogen Energy 43, 18883-18895. DOI: 10.1016/j.ijhydene.2018.08.094

**List of patents and protection rights:**

1. Gryta M., Tomczak W., Morawski A.W., Method of osmotic membrane distillation with concentration of osmotic solution and system for osmotic membrane distillation with concentration of osmotic solution. Exclusive rights number: Pat.230010. Date of granting the right: 17.05.2018
2. Gryta M., Tomczak W., Morawski A.W., Method of filtration of fermented glycerol solutions and system for filtration of fermented glycerol solutions. Exclusive rights number: Pat.229975. Date of granting the right: 20.03.2018

**List of active participation in conferences:**

Lectures:

1. Tomczak W., *Updated $K_d$ database for freshwater systems: Effects of m/V, DOC and pH on $K_d$ distributions. Parameters of Abril and Fraga model*, 2018 Interim Meeting of Working Group 4, International Atomic Energy Agency Environmental Laboratories, Monaco, May 15-16, 2018.
2. Tomczak W., *Freshwater $K_d$ distributions in function of mass-volume ratio, dissolved organic carbon and pH*, 3rd European Radiological Protection Research Week, Rovinj, Croatia, 1-5 October 2018.

3. Tomczak W., *The variability of the solid-liquid distribution coefficient $K_d$ for freshwater systems*, Workshop: Assessing risks from radioactive legacy sites and how to better present uncertain information, University of Oxford, UK, 19-20 March 2019.
4. Tomczak W., *Membrane bioreactors*, XVI Summer School of Membrane "Membranes and membrane processes in theory and practice", Szczecin, Poland, July 20-22, 2022.

**List of scholarships and scientific internships:**

1. Institution: Aix-Marseille University
   Mechanics, Modelling and Clean Processes Laboratory
   Location: Marseille, France
   Deadline: from 1 December 2015 to 30 June 2017
   Nature of the internship: Employment as a post-doctoral researcher
2. Institution: Institute for Radiological Protection and Nuclear Safety IRSN
   Research Laboratory on Radionuclides Transfer in Aquatic Ecosystems
   Location: Saint-Paul-Lez-Durance, France
   Deadline: from 6 November 2017 to 5 May 2019
   Nature of the internship: Employment as a post-doctoral researcher
3. Institution: French Alternative Energies and Atomic Energy Commission CEA
   Fuels Research Department
   Location: Saint-Paul-Lez-Durance, France
   Deadline: from 12 March 2020 to 31 August 2021
   Nature of the internship: Employment as a post-doctoral researcher
4. Institution: Synchrotron SOLEIL
   Location: Saint-Aubin, France
   Deadline: from 9 January 2021 to 11 July 2021
   Nature of the internship: Guest stay

**List of participation in scientific grants:**

1. Project "Studies on the influence of membrane properties and process conditions on the mechanism of membrane destruction in the membrane distillation process", implemented under the OPUS 8 programme, National Science Centre (NCN). Function:Executor
2. The A*MIDEX (Aix-Marseille Initiative of Excellence) project, no. ANR-11-IDEX-0001-02, financed by the French government's "Investissements d'Avenir" programme, managed by the French National Research Agency (Agence Nationale de la Recherche ANR). Function: Post-doctoral researcher
3. MODARIA II (Development, Testing and Harmonization of MOdels and DAta for Radiological Impact Assessment) project of the International Atomic Energy Agency (IAEA), Function: Post-doctoral researcher
4. Project "Investigation of hydrophobic properties of polypropylene membranes used in a membrane contactor for separation of brines contaminated with organic substances", implemented under the OPUS 15 programme, National Science Centre (NCN). Function: Executor

**Other important academic and professional achievements:**

1. Member of the Thematic Advisory Panel of the following journals:
   - International Journal of Molecular Sciences (ISSN: 1422-0067, IF2021: 6,208)
   - Fermentation (ISSN: 2311-5637, IF2021: 5,123)
   - Materials (ISSN: 1996-1944, IF2021: 3,748)
   - Water (ISSN: 2073-4441, IF2021: 3,530)

2. Member of the Editorial Board of the Journal of Modern Polymer Chemistry and Materials (ISSN 2788-8193).
3. Participation in expert teams: 2017-2019
   Member of the "Transfer Processes and Data for Radiological Impact Assessment" Group, established and working within the MODARIA II project, of the International Atomic Energy Agency
4. Membership in scientific societies:
   - Polish Membrane Society PTMem (from March 4, 2023, member of the Board of the Polish Membrane Society PTMem, function: secretary)
   - Polish Chemical Society PCS
   - Polish Federation of Biotechnology
   - Association of Chemical Industry Engineers and Technicians
   - Bydgoszcz Scientific Society
   - International College of the Baltic University Supervisor Program

POLITECHNIKA BYDGOSKA
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# CRITERION 3

# Qualifications of academic teachers or research staff conducting education at the doctoral school

## mechanical engineering

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# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Adam Lipski

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

PhD, DSc/field of engineering and technical sciences, mechanical engineering, 2019.

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

1. Methodology and planning of research – lecture.
2. Data analysis – statistics, data visualization – laboratory.

The following lists refer to the last 5 years, with particular emphasis on achievements related to classes conducted at the Doctoral School of the Bydgoszcz University of Technology.

**List of doctoral dissertation supervisor functions:**

1. Piotr Swacha – *Verification of selected hypotheses of fatigue damage accumulation in the high- and gigacycle range*.
2. Andrzej Świtała – *Selection of structural features of a leaf with a variable profile on the example of UAV*.
3. Sebastian Karolewski – *Influence of selected technological parameters on the strength of the glued joint used in the joints of elements with different mechanical properties*.

**List of reviews in the procedure for scientific promotion:**

1. Review of Ph.D. thesis entitled *Energy Methods for Fracture and Fatigue Assessment* by Dario Francesco Santonocito submitted to the University of Messina (Italy) – opinion prepared for the purposes of the procedure for awarding the degree *of Doctor Euripeaus*, 2019.
2. Piotr Jan Sulich – *Modeling of the low-cycle steel fatigue process under non-isothermal conditions*, Cracow University of Technology, 2021.
3. Dariusz Smolarski – *Direct spectral method for counting bimodal stress cycles*, Cracow University of Technology, 2023.

**List of scientific publications:**

1. Lipski A.: *Change of Specimen Temperature during the Monotonic Tensile Test and Correlation between the Yield Strength and Thermoelasto-Plastic Limit Stress on the Example of Aluminum Alloys*. Materials, 2021, 14, 1, 13 (IF – 3.784, points of the Ministry of Science and Higher Education – 140).
2. Swacha P., Lipski A.: *Tests of fatigue life in the gigacycle range using a resonant testing machine. Design and principle of operation*. In: Pawliczek R., Owsiński R., Łagoda T. (eds.), Design, construction and operation of machines part I. Studies and Monographs Z. 558, 179-190, Oficyna Wydawnicza Politechnika Opolska, Opole, 2021 (Points of the Ministry of Science and Higher Education - 20).

3. Lee H.W., Basaran C., Egner H., Lipski A., Piotrowski M., Mroziński S., Bin Jamal N., Lakshmana R.Ch.: *Modeling ultrasonic vibration fatigue with unified mechanics theory*. International Journal of Solids and Structures, 2022, 236-237, 111313 (IF – 3.6, points of the Ministry of Science and Higher Education – 140).
4. Lee H.W., Fakhri H., Ranade R., Basaran C., Egner H., Lipski A., Piotrowski M., Mroziński S.: *Modeling fatigue of pre-corroded body-centered cubic metals with unified mechanics theory*. Materials & Design, 2022, 224, 111383, 1-21 (IF – 8.4, points of the Ministry of Science and Higher Education – 140).
5. Lee H.W., Bin Jamal N., Fakhri H., Ranade R., Egner H., Lipski A., Piotrowski M., Mroziński S., Lakshmana R.Ch., Djukic M.B., Basaran C.: *Unified Mechanics of Metallic Structural Materials*. In: Reference Module in Materials Science and Materials Engineering. Elsevier, Amsterdam, 2023 (points of the Ministry of Science and Higher Education - 20).
6. Mroziński S., Lipski A., Piotrowski M., Egner H.: *Influence of pre-strain on staticand fatigue properties of S420M steel*. Materials, 2023, 16, 2 (590) (IF – 3.4, points of the Ministry of Science and Higher Education - 140).
7. Swacha P., Lipski A., Piotrowski M.: *Determination and experimental verificationof the relation between stress amplitude and vibration amplitude in the VHCF regime*. In: Pyrzanowski P., Papis M. (eds.): Experimental Mechanics. Materials Research Forum, Materials Research Proceedings, 30, 75-82, Millersville PA, USA, 2023 (points MNiSW - 5).
8. Swacha P., Lipski A.: *Cracking of S355J2+N steel in the high-cycle and very-high-cycle fatigue regimes*. International Journal of Fatigue, 2023, 168, 107388, 1-10 (IF – 6.0, points of the Ministry of Science and Higher Education – 140).
9. Lipski A., Witek M., Abdelghani M., Swacha P.: *Influence of Plastic Strain on Heat Capacity of L485ME Pipe Steel Grade*. Energies, 2024, 17, 7 (1554), 1-16 (IF – 3.2, points of the Ministry of Science and Higher Education - 140).

**List of patents and protective works:**
lack

**List of active participation in conferences:**
1. Lipski A.: *Application of infrared thermography in strength tests*. Paper as part of the Meeting of the Section of Experimental Methods of Mechanics of the Committee on Mechanics of the Polish Academy of Sciences, Bydgoszcz, 18.05.2019
2. Lipski A.: *Gigacycle metal fatigue*. Paper at the XVII National Conference on Fracture Mechanics, Huciska, 16-19.09.2019
3. Lipski A.: *A proposition of the model of temperature change description during fatigue loading*. Paper as part of the 1st Virtual Euroepan Conference on Fracture VECF1,29.06 –1.07.2020
4. Swacha P., Lipski A.: *Tests of fatigue life in the gigacycle range using a resonant testing machine. Design and principle of operation*. Paper as part of the XXX Symposium on Fundamentals of Machine Design, Opole, 13-14.09.2021
5. Swacha P., Lipski A.: *Fracture of S355J2+N steel in the high- and gigacycle range*. Paperas part of the XVIII National Conference on Fracture Mechanics, Wrocław, 20-21.09.2021
6. Lipski A., Swacha P.: *Ultrasonic system for fatigue testing*. Paper as part of the XVI Symposium The Impact of Vibrations on the Environment, Krakow, 22-23.09.2022
7. Lipski A.: *Fatigue Tests in the Gigacycle Range*. Plenary paper as part of the 29th Symposium on Experimental Mechanics, Warsaw, 19-22.10.2022
8. Lipski A.: *Fatigue tests in the gigacycle range*. Lecture as part of the 10th Interdisciplinary Seminar of the Silesian University of Technology, Bydgoszcz, 26.10.2022

9. Lipski A., Mroziński S., Piotrowski M.: *The importance of experimental research in the design and construction process*. Paper as part of the XXXI Symposium on Fundamentals of Machine Design, Szklarska Poręba, 18-20.09.2023

**List of scholarships and scientific internships:**
lack

**List of participation in scientific grants:**
lack

**Other important academic and professional achievements:**
Managing international and national research projects:

1. Special research project No EUREKA/61/2006 *Improving fatigue life of rivet joints used in aerospace structures* implemented within the framework of the international programme EUREKA – IMPERJA E!3496 *Improving the Fatigue Performance of Riveted Joints in Airframes*. UTP Bydgoszcz, 2006-2010, Project Manager.
   Members of the consortium implementing the project: Institute of Aviation in Warsaw, AGH University of Science and Technology in Krakow, University of Technology and Life Sciences in Bydgoszcz, Military University of Technology in Warsaw, Polish Aviation Works in Mielec (Sikorsky Aircraft Corp., USA), Evektor, spol. s r.o. (Czech Republic), Stresstech Oy (Finland).
2. Research project of the State Committee for Scientific Research No. PB-7 T07B 00413: *Assessment of the durability of structural elements in the fatigue crack propagation phase – numerical analysis possibilities*. ATR Bydgoszcz, 1998, Project Manager.

Participation in international and national research projects:

1. Research project KBN No. 7 T07B 010 18: *Fatigue tests of complex structural elements under operational loads*. ATR Bydgoszcz, 2000-2003, contractor.
2. KBN Research Project No. 4 T07C 020 27: *Experimental and hybrid method of analysis of strain distributions in structural elements under fatigue loads*. ATR Bydgoszcz, 2004-2007, main contractor.
3. Research project KBN No. 4 T07D 026 28: *Analysis of the energy intensity of technological shear in the processes of crushing cereal grains*. UTP Bydgoszcz, 2005-2008, contractor.
4. Research project No. PB 2563/T02/2006/31: *Investigation of the stabilization process of metal materials under conditions of variable loads*. UTP Bydgoszcz, 2006-2009, main contractor.
5. Research project No. PB 1215/B/T02/2011/40: *Tests of accumulation of fatigue damage of steel for operation at elevated temperatures*. UTP Bydgoszcz, 2011-2013, main contractor.
6. Research project of the National Centre for Research and Development No. NR03-0022-04/2008: *System for testing static and fatigue properties of nanomaterials and microelements*. UTP Bydgoszcz, 2008-2010, contractor.
7. NCBiR INNOTECH Programme No. DZP/INNOTECH-III/528/2014: *Tram bogie with a non-rigid articulated frame, built under a low-floor tram*. UTP Bydgoszcz, 2014-2017, main contractor.

Participation in expert and competition teams:

1. Intersectional Team on Fatigue and Fracture Mechanics of Materials and Structures of the Committee on Machine Building of the Polish Academy of Sciences – expert in the 2011-2014 term.

Manager of several dozen research and development works carried out in the Laboratory of Materials and Structures Testing of the Faculty of Mechanical Engineering of the Bydgoszcz University of Technology, accredited by the Polish Centre for Accreditation (PCA Accreditation No. AB 372). Co-contractor of several hundred other R+D works carried out in this laboratory. Quality Manager at the Materials and Structures Testing Laboratory.

Participation in European and other international and national programs:

1. The project is co-financed by the European Union from the European Social Fund No. POKL.04.01.01.-00-013/09 *Biomedical Engineering - Direction of the Future*, years 2009-2012, project implementer.
2. The project is co-financed by EEA/Norway Grants No. FSS/2013/HEI/W/0009 *Computer Aided Engineering – Direction of the Future*, 2013-2016, project implementer.
3. Project co-financed by the European Regional Development Fund No. RPKP.01.01.00-04-0001/17 *Laboratories of technical and exact sciences dedicated to the development of research potential in the field of innovative solutions and technologies of key importance for the economy of the Kujawsko-Pomorskie Voivodeship*, project coordinator on the side of the Consortium Leader (Bydgoszcz University of Technology – Leader, Nicolaus Copernicus University in Toruń, Kazimierz Wielki University in Bydgoszcz), 2022 – 2023, project value: over PLN 44 million).

Major certifications and trainings:

1. International ITC Level 1 certificate obtained during the Thermography Training Course organized by the Infrared Training Center (Sweden) and EC Test Systems, 2014.
2. Internal auditor of the quality management system in a testing and calibration laboratory (ISO 17025:2005), NOT Bydgoszcz, 2010.
3. Training "STATISTICA basic course" organized by StatSoft Polska 2016

Internships in foreign and domestic research or academic centres:

1. II Summer School of Fracture Mechanics *Dynamic problems of fracture mechanics, including fatigue issues*. Organizer: Wrocław University of Technology, Szklarska Poręba, 1996
2. Summer School on Failure in Structures - project TEMPUS JEP 8098. Organizer: Kielce University of Technology, Kielce Ameliówka, 1997
3. IV Summer School of Fracture Mechanics *Experimental methods in fracture mechanics*, Organizer: Wroclaw University of Science and Technology / Lviv Institute of Physics and Mechanics, Lviv, Ukraine, 1998
4. V Summer School of Fracture *Mechanics Non-destructive methods in fracture mechanics and fatigue of materials*. Organizer: Wrocław University of Science and Technology, Zlate Hory, Czech Republic, 1999
5. German-Polish VI Summer School of Fracture Mechanics *Formation and properties of short cracks under conditions of variable loads*. Organizer: Technische Universität Dresden, Dresden, Germany, 2000

Decorations:

1. Silver Cross of Merit, 2020.
2. Bronze Medal for Long Service, 2012.

Awards and distinctions:

1. Rector's Award of the Bydgoszcz University of Technology for 2022.
2. Rector's Award of the Bydgoszcz University of Technology for 2021.
3. First Degree Award of the Rector of the Bydgoszcz University of Technology for outstanding scientific achievements for 2019.
4. First degree team award of the Rector of the Bydgoszcz University of Technology for outstanding scientific achievements for the year 2002.
5. Second degree team award of the Rector of the Bydgoszcz University of Technology for outstanding scientific achievements for the years 2003, 2006, 2012, 2016, 2021, 2022.
6. Second degree team award of the Rector of the Bydgoszcz University of Technology for outstanding achievements in teaching activities for the years 2004, 2005, 2007.
7. Distinction of doctoral dissertation by the Council of the Faculty of Mechanical Engineering of the University of Technology and Agriculture in Bydgoszcz, 2003.
8. Second place at the provincial level as part of the Tournament of Young Masters of Technology in 1990.
9. Second degree award in the competition for the best diploma thesis in 1990 from the Association of Polish Mechanical Engineers and Technicians – Provincial Branch in Bydgoszcz and the Board of Education in Bydgoszcz.
10. Distinction with a commemorative silver coin minted on the occasion of the 60th anniversary of the University of Technology and Life Sciences in Bydgoszcz, 2011 (50 coins minted).
11. Diploma of the 60th anniversary of UTP in recognition of his contribution to the development of the University of Technology and Life Sciences and in gratitude for his work to date, Rector of UTP, 2011.
12. Distinction with a commemorative medal of the 60th anniversary of the Faculty of Mechanical Engineering of the University of Technology and Life Sciences in Bydgoszcz, 2011.
13. Distinction of the Dean of the Faculty of Mechanical Engineering of the University of Technology in Bydgoszcz Laurel of the Faculty of Mechanical Engineering of the University of Technology in Bydgoszcz for special scientific achievements and great commitment and conscientious fulfillment of academic duties in the years 2011/2012, 2012.

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Dariusz Boroński

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

Professor, Engineering and Technical Sciences, 2019

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

1. Contemporary trends in the development of science (in Polish and English),
2. Diploma seminar (in Polish and English).

The following lists refer to the last 5 years, with particular emphasis on achievements related to classes conducted at the Doctoral School of the Silesian University of Technology.

(list for the years 2020-2024)

**List of doctoral dissertation supervisor functions:**

1. Dominika Płaczek
2. Katarzyna Balcer
3. Wojciech Ziółkowski
4. Radosław Stachowiak

**List of reviews in the procedure for scientific promotion:**
Habilitation:

1. Andrzej Kurek,
2. Paweł Wysmulski (in progress).

Doctoral studies:

1. Wioletta Górska-Włodarczyk,
2. Jolian Gooseberry,
3. Marek Stepnowski,
4. Sebastian Lipiec,
5. Dawid Machalica.

**List of scientific publications:**

1. Piasecki A, Sobkowiak J, Boroński D, Siwińska-Ciesielczyk K, Paczos P. The Influence of the Modification of Carbon Nanotubes on the Properties of Copper Matrix Sintered. Materials, 2024, 17, 6 (1427), https://doi.org/10.3390/ma17061427,
2. Płaczek D, Maćkowiak P, Boroński D. Fatigue Analysis of Welded Joints Using a Thin-Walled Al/Fe Explosive Welded Transition Joints. Materials, 2023, 16, 18 (6259), doi: 10.3390/ma16186259

3. Ziółkowski W, Boroński D, Skibicki A, Stachowiak R, Kosturek R, Śnieżek L. Mechanical Properties and Microstructure of Dissimilar S355/AA6061-T6 FSW Butt Joints. Materials, 2023, 16, 17 (5950), https://doi.org/10.3390/ma16175950,
4. Trepczyńska-Łent M, Boroński D, Maćkowiak P. Mechanical properties and microstructure of directionally solidified Fe-4.25%C eutectic alloy. Materials Science and Engineering A, 2021, 822, https://www.sciencedirect.com/science/article/pii/S0921509321009126?via%3Dihub, doi: 10.1016/j.msea.2021.141644,
5. Boroński D, Dzioba I, Kotyk M, Krampikowska A, Pała R. Investigation of the Fracture Process of Explosively Welded AA2519-AA1050-Ti6Al4V Layered Material. Materials, 2020, 13, 10, https://www.mdpi.com/1996-1944/13/10/2226/pdf, doi: 10.3390/ma13102226
6. Boroński D. Local mechanical properties of explosively welded AA2519-AA1050-Ti6Al4V layered material. Welding in the World, 2020, 64, https://link.springer.com/article/10.1007/s40194-020-00984-2, doi: 10.1007/s40194-020-00984-2
7. Boroński D, Skibicki A, Maćkowiak P, Płaczek D. Modeling and analysis of thin-walled Al/steel explosion welded transition joints for shipbuilding applications. Marine Structures, 2020, 74, - , -, doi: 10.1016/j.marstruc.2020.102843
8. Karolewska K, Ligaj B, Boroński D. Strain analysis of Ti6Al4V titanium alloy samples using Digital Image Correlation. Materials, 2020, 13, 3398, 1-19, https://www.mdpi.com/1996-1944/13/15/3398, doi: 10.3390/ma13153398
9. Kotyk M, Boroński D, Maćkowiak P. The Influence of Cryogenic Conditions on the Process of AA2519 Aluminum Alloy Cracking. Materials, 2020, 13, 7, 13, doi: 10.3390/ma13071555.

**List of patents and protective works:**

1. Authors: Maćkowiak Paweł, Urbański Krzysztof, Płaczek Dominika, Boroński Dariusz, Kotyk Maciej. Patent title: Hydraulic system of a test rig for testing hydraulic components, material and construction samples, Patent/protection right number: 240731

**List of active participation in conferences:**

1. Experimental Mechanics - 29th Symposium, Warsaw, Poland, October 19÷22, 2022.

**List of scholarships and scientific internships:**

lack

**List of participation in scientific grants:**

lack

**Other important academic and professional achievements:**

1. Chairman of the Scientific Council of the discipline of mechanical engineering at the Bydgoszcz University of Technology
2. Head of the Department of Fundamentals of Machine Design, Faculty of Mechanical Engineering

POLITECHNIKA BYDGOSKA
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HR EXCELLENCE IN RESEARCH

# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Dariusz Skibicki

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

1. professor, 2019, Engineering and Technical Sciences
2. habilitated doctor, 2009, technical sciences / construction and operation of machines
3. Ph.D., 2000, Technical Sciences / Mechanical Engineering and Operation

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

1. Doctoral seminar
2. Numerical methods

The following lists refer to the last 5 years, with particular emphasis on achievements related to classes conducted at the Doctoral School of the Bydgoszcz University of Technology.

**List of reviews in the procedure for scientific promotion:**

1. Review of the doctoral dissertation of Marcin Jamontt, M.Sc., Eng., entitled "Engineering and Inspection Problems Study for Turbine Guide Vane Mechanical Component", Warsaw University of Technology, 2021.
2. Review in the procedure for awarding the degree of habilitated doctor to Wojciech Stanisław Macek, PhD, Eng., applying for the degree of habilitated doctor in the field of engineering and technical sciences, in the discipline of mechanical engineering, Gdańsk University of Technology, 2022.
3. Review of the doctoral dissertation of Karol Czekaj, MSc, Eng. entitled "Modelling of FEM dynamics in mechanical systems taking into account component collisions" in the discipline of mechanical engineering, Opole University of Technology 2025.
4. Review in the procedure for awarding the degree of habilitated doctor to Adam Tomczyk, PhD, Eng., Bialystok University of Technology 2025.
5. Review of the application of Zdzisław Kaliniewicz, PhD, DSc, Eng., for the title of Professor in the field of engineering and technical sciences in the discipline of mechanical engineering, 2025.

**List of scientific publications:**

1. Skibicki, D., Karolczuk, A. Error tolerance for effective model parameter estimation in multiaxial fatigue life prediction, International Journal of Fatigue, 2025, 191, 108700
2. Pałczyński, K., Seyda, J., Skibicki, D., Pejkowski, Ł., Macek, W., An image processing approach for fatigue crack identification in cellulose acetate replicas, Engineering Failure Analysis, 2024, 164, 108663
3. Karolczuk Aleksander, Kurek Andrzej, Prażmowski Mariusz, Żak Krzysztof, Skibicki Dariusz, Pejkowski Łukasz, Skubisz Piotr, Witkowska Małgorzata, Key role of surface defects in the multiaxial fatigue life of additively manufactured unmachined 18Ni300 maraging steel, International Journal of Fatigue, 2024

4. Strzelecki, P., Skibicki, D., Pejkowski, Ł. Method for determining the S-N curve for a low probability of failure, Journal of Theoretical and Applied Mechanics, 2024, 62(4), pp. 683–694
5. Skibicki Dariusz, Analysis of the Tanaka non-proportionality parameter under fatigue loading, Proceedings of the 11th International Conference on Applied Mechanics / ed. Przemysław Strzelecki, 2023
6. Pałczyński Krzysztof, Skibicki Dariusz, Pejkowski Łukasz, Andrysiak Tomasz, Application of machine learning methods in multiaxial fatigue life prediction, Fatigue & Fracture of Engineering Materials & Structures, 2023
7. Skibicki Dariusz, Pejkowski Łukasz, Karolczuk Aleksander, Impact of the plasticity modeling on fatigue life prediction for steels showing modest non-proportional hardening, International Journal of Fatigue, 2023
8. Karolczuk Aleksander, Liu Yongming, Kluger Krzysztof, Derda Szymon, Skibicki Dariusz, Pejkowski Łukasz, Physics-constrained Gaussian process for life prediction under in-phase multiaxial cyclic loading with superposed static components, International Journal of Fatigue, 2023
9. Rachwał Miłosz, Skibicki Dariusz, Fatigue analysis of the drive shaft of a passenger car, Developments in mechanical engineering, 2022
10. Karolczuk Aleksander, Skibicki Dariusz, Pejkowski Łukasz, Gaussian Process for Machine Learning-Based Fatigue Life Prediction Model under Multiaxial Stress-Strain Conditions, Materials, 2022
11. Scheffler Christian, Skibicki Dariusz, Rotational moulding machine - design, construction and performance analysis, Developments in mechanical engineering, 2022
12. Galek Bartłomiej, Skibicki Dariusz, Topological optimization of the supporting structure of a drone, Developments in mechanical engineering, 2022
13. Skiba David, Skibicki Dariusz, Topological optimization of car lift structures, Developments in mechanical engineering, 2022
14. Skibicki Dariusz, Pejkowski Łukasz, Karolczuk Aleksander, Seyda Jan, Verification of the Tanaka non-proportional isotropic cyclic hardening model under asynchronous loading, International Journal of Solids and Structures, 2022
15. Łagoda Tadeusz, Głowacka Karolina, Kurek Marta, Skibicki Dariusz, Formulation of Strain Fatigue Criterion Based on Complex Numbers, Materials, 2021
16. Seyda Jan, Skibicki Dariusz, Pejkowski Łukasz, Skibicki Andrzej, Domanowski Piotr, Maćkowiak Paweł, Mechanical properties and microscopic analysis of sintered rhenium subjected to monotonic tension and uniaxial fatigue, Materials Science and Engineering A, 2021
17. Seyda Jan, Pejkowski Łukasz, Skibicki Dariusz, Identification of fatigue damage mechanism in PA38-T6 aluminum alloy under multiaxialloadings - initial research, Procedia Structural Integrity, 2020
18. Aleksandrowicz Piotr, Stopel Michał, Skibicki Dariusz, Identification parameters for accident reconstruction software at frontal car impact, Materials Testing, 2020

**List of active participation in conferences:**

1. Dariusz Skibicki, Analysis of the Tanaka non-proportionality parameter for fatigue loadings, 11th International Scientific Session, Applied Mechanics, Bydgoszcz 2021
2. Dariusz Skibicki, Łukasz Pejkowski, Jan Papuga, Studies of multiaxial fatigue life of 42CrMo4+QT steel specimens of different roughness, XXXI Symposium on Fundamentals of Machine Design, Szklarska Poreba 2023
3. Dariusz Skibicki, Envelopes of Shear and Normal Stresses for Multiaxial Stress State, 12th International Scientific Session, Applied Mechanics, Bydgoszcz 2024

**List of patents and protective works:**

1. Łukasz Pejkowski, Dariusz Skibicki. Enhancing the transient strength and fatigue durability of metallic rod elements. P.451705, 2025.

**List of scholarships and scientific internships:**

lack

**List of participation in scientific grants:**

lack

**Other important academic and professional achievements:**

1. Director of the Doctoral School of the Silesian University of Technology,
2. Head of the Department of Mechanics and Computational Methods at the Faculty of Mechanical Engineering,
3. Organizer of the National Competition for Youth "miniSUMO Robot Competition".

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# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Janusz Sempruch

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

1. Submission of the doctoral dissertation entitled "*Development of fatigue cracks in cylindrical steel specimens under conditions of variable torsion*"; PhD degree in technical sciences obtained at the Częstochowa University of Technology in 1983.
2. Submission of scientific achievements and habilitation dissertation entitled "*Fatigue strength criterion of structural steel 25CrMo4 under conditions of complex stress*": the degree of habilitated doctor was obtained in 1992 at the AGH University of Science and Technology in Krakow.
3. Submission of scientific achievements in the procedure for obtaining the academic title of professor; The academic title of professor is awarded by the President of the Republic of Poland at the request of the Faculty of Automotive and Construction Machinery of the Warsaw University of Technology in 2002.

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

1. Doctoral Seminar, sem. 7 (currently) – technical sciences.
2. Doctoral Seminar, sem. 2 and 5 (earlier) – technical sciences.

**List of functions of supervisor or assistant supervisor of doctoral dissertations**:

1. Piątkowski Tomasz (1999), currently Professor of Associate Professor,
2. Skibicki Dariusz (2000), currently Professor
3. Cichański Artur (2002)
4. Nowicki Krzysztof (2005)
5. Strzelecki Przemysław (2014), currently Professor of Bialystok University of Technology, DSc, Eng.
6. Tomaszewski Tomasz (2015), currently preparing an application for the initiation of proceedings for the award of the degree of Doctor of Science,

**List of reviews in the procedure for scientific promotion:**

Reviews of doctoral dissertations:

1. Mroziński Stanisław, ATR Bydgoszcz, 1996,
2. Boroński Dariusz ATR Bydgoszcz, 1999,
3. Lipski Adam ATR Bydgoszcz, 2003
4. Ligaj Bogdan, ATR Bydgoszcz, 2006,
5. Szusta Jarosław, Bialystok University of Technology 2008,
6. Wilczarska Joanna, UTP Bydgoszcz, 2008,
7. Krzyżak Daniel, Opole University of Technology, 2016,
8. Skocki Radosław. UTP Bydgoszcz 2016,

9. Derda Szymon, Opole University of Technology, 2024.

Reviews of scientific achievements in the habilitation procedure:

1. Jakubowski Marek, Gdańsk University of Technology 2003,
2. Mroziński Stanisław, ATR Bydgoszcz, 2009,
3. Śnieżek Lucjan, WAT, 2011,
4. Szala Grzegorz, Gdańsk University of Technology, 2012,
5. Będkowski Włodzimierz, Opole University of Technology, 2012
6. Socha Michał, Bialystok University of Technology 2013
7. Machniewicz Tomasz AGH Kraków, 2013.
8. Kozak Janusz, UTP Bydgoszcz, 2016,
9. Boroński Dariusz, UTP Bydgoszcz, 2017,
10. Krasoń Wiesław, WAT, 2020,
11. Kurek Marta, Opole University of Technology 2021.

Reviews of scientific achievements in the procedure for awarding the academic title of professor:

1. Kocańda Dorota, Military University of Technology, 2008,
2. Tylicki Henryk, UTP Bydgoszcz. 2009,
3. Bieliński Marek, UTP Bydgoszcz, 2011,
4. Śnieżek Lucjan, WAT 2019.
5. Egner Halina , Cracow University of Technology 2019,
6. Kawalec Andrzej, Rzeszow University of Technology, 2019.
7. Bogdanowicz Zdzisław , WAT, 2019,
8. Zalewski Robert, Warsaw University of Technology, 2019,
9. Niesłony Adam, Opole University of Technology 2020,
10. Spindleman Piotr, Wrocław University of Science and Technology, 2020.
11. Bogdanowicz Zdzisław – confirmatory application, WAT, 2023.

Other reviews:

1. reviews of monographs, including habilitation monographs and books – 5.

Honorary Doctorate

1. Józef Szala, UTP Bydgoszcz, Laudation.
2. Andrzej Neimitz, Kielce University of Technology 2017. Opinion commissioned by the Senate of UTP Bydgoszcz.

**List of scientific publications:**

Published works – a total of 158 items (authorship or co-authorship), including:

1. monographs and dissertations – 1;
2. books, textbooks, scripts - 4;
3. original scientific publications (peer-reviewed) – 86;
4. publications in conference materials, scientific reports – 64;
5. scientific editors of monographs – 3;
6. In addition, studies not intended for printing – 36.

Major publications from recent years

1. Strzelecki P., Sempruch J., Determination of the Statistical Power of Fatigue Characteristics in Relation to the Number of Samples, Applied Sciences, 2024, 14(6), 2440, 1-13, p-ISSN: 2076-3417
2. Sempruch J., Strzelecki P., Borowskie., editing of the monograph: Problems of the Development of Work Machines, University Publishing House of the Bydgoszcz University of

Technology, 2023.
p-ISBN: 978-83-66530-70-6.

3. Piątkowski, T., Wolski, M., Tomaszewski, T., Strzelecki, P., Sempruch, J.Analysis of the positioning process of objects on an oblique plane with barriers, Mechanism and Machine Theory, 168,104580, 2022
4. T Tomaszewski, J Sempruch, Experimental material data for a mini specimen taken Journal of theoretical and Applied Mechanics, 2017.
5. Sempruch Janusz Krzysztof, Strzelecki Przemysław. Experimental method for plotting s-n curve with a small number of specimens, Polish Maritime Research, 23, -, 129-137, 2016. ISSN: 1233-2585.
6. Skibicki D., Sempruch J., Pejkowski L.: Steel X2CrNiMo 17-12-2 Testing for Uniaxial Proportional and Non-Proportional Loads as dellivered and in the Annealed Condition. Materials Science Forum Vol.726 (2012) pp 171-180.
7. T. Piątkowski, J. Sempruch: Numerical research of positioning process of unit loads by system of oblique friction force fields. Archives of Transport 22, 3, 2010, 337-358.
8. Piątkowski T., Sempruch J.: Model of inelastic impact of unit loads. Packaging Technology and Science, John Wiley & Sons, 2009, vol. 22/1, pp. 39-51.
9. Piątkowski T., Sempruch J.: Model of the process of load unit stream sorting by means of flexible active fence. Mechanism and Machine Theory, Elsevier, 2008, vol. 43/5, pp. 549-564.

**List of patents and protective works:**

1. P.278 289 - "A stand for fatigue tests of single-track vehicle frames, especially mopeds and motorcycles", co-authorship of Szala J., Topoliński T.. ,
2. P.278 332 - "A stand for fatigue tests of pipe samples and structural elements, especially bicycle forks", co-authorship of Szala J., Topoliński T., Bieliński K.. ,
3. Sempruch Janusz Krzysztof, Piątkowski Tomasz.Patent title: Active penstock for scraping small-size unit loads. Document type: Utility model. Country code: PL. Patent/protection right number: 68124. Invention application number: 122456. Date of filing the invention: 2013.10.14. Patent classification symbol: PL 68 124 Y1. Notification: 2015.04.27 of the Polish Patent Office. Granting protection: 2015.12.31 Polish Patent Office
4. Sempruch Janusz Krzysztof, Piątkowski Tomasz. Patent: Active penstock for scraping small-size unit loads. Document type: Utility model. Country code: PL. Patent/protection right number: 68124. Invention application number: 122456. Date of filing the invention: 2013.10.14. Patent classification symbol: PL 68 124 Y1. Notification: 2015.04.27 of the Polish Patent Office. Granting protection: 2015.12.31 Polish Patent Office
5. Silver medal at the 62nd Fair of Inventions, Research and New Technologies BRUSSELS INNOVA 2013. For the fatigue test bench of mini-specimens under conditions of variable uniaxial loads.

**List of active participation in conferences:**

Current:

6. Symposium on Fundamentals of Machine Design, from the nineteenth edition of the Symposium to the present a member of the scientific committee,

1. Scientific Conference "Problems of Development of Machines of Machines" – XXVII to XXX (2014 – 2025) edition of this conference – member of the scientific committee.
2. Symposium on "Fatigue and Fracture Mechanics", 1998, 2000, 2002, 2004, 2006 and 2008, 2010, 2012, 2014, 2016 and later, to date,
3. Applied Mechanics, Bydgoszcz 2010, 2012, 2014, 2016 and later to date - member of the Scientific Committee.

Other important ones from recent years:

1. II Congress of Polish Mechanics 2011 – member of the scientific committee.
2. XI CONGRESS OF CONSTRUCTION AND OPERATION OF TECHNICAL EQUIPMENT Radom, 2011, member of the scientific committee.
3. XXIV and XXV International Conference SCIENTIFIC AND DIDACTIC THEORY OF MECHATRONIC MACHINES AND SYSTEMS, 2014, 2016, member of the scientific committee.
4. XI National Scientific and Training Conference "Fracture Mechanics", Kielce – Cedzyna 2007, 2009.
5. International scientific conference (formerly – seminar) "Advances in control and design" 1997 – 2010, chairman of the scientific committee,
6. XXI National and I International Scientific and Didactic Conference on the Theory of Machines and Mechanisms, Polish Committee of the TMiM KBM PAN, September 2008

**List of scholarships and scientific internships:**

1. St. Petersburg, Russia, one month, 1976.
2. DAAD scholarship, 20 months 1985 –1987, carried out at RW TH Aachen, Institut fuer Werkstofkunde (prof. A. Troost).
3. Jaroslav, Russia. Two weeks in 1993.
4. Offenbach
5. Tempus Fellowship, one month, 1997, TU GH Paderborn (Prof. M. Pahl, Prof. P. Steiner).

**List of participation in scientific grants:**

1. KBN PB-1288/S1/93/04 research project "Deterministic and probabilistic approach to phase shift of components of the complex state of fatigue loads in fatigue strength analysis" - implementation in 1993 - 1996.
2. targeted project KBN PC-1557/C.TO7-7/96 "Development of guidelines for testing and testing of a scissor lifting device in the field of strength and rigidity", implementation in the years 1996 – 1998.
3. supervisor project of KBN PB-958/TO8/98/15"Modeling of biaxial fatigue loads", implementation in 1998 - 2000.
4. supervisor project KBN PB-959/TO7/98/15 "Fatigue strength criterion for biaxial load with phase shift of components, implementation in 1998 - 1999.
5. supervisor project of KBN PB-996/TO7/99/16 "Analysis of the scraping process on the example of a parcel switchboard", implementation in 1999-2000.
6. supervisor project of KBN PB-0832/T07/2003/25 "Analysis of the possibility of using an artificial neural network for fatigue life prediction", implemented in 2003-2005.
7. project within the framework of the Regional Research and Implementation Fund entitled "Research on the revitalization of used machines in terms of their modernization, in particular in the field of control and drives", implementation period 03.08.2006 – 31.12.2006. Signature of the GP project. I.3020-UDOT-921/2006.
8. own research project "Experimental verification of the fatigue load disproportionality model", main contractor, implementation period 07.11.2006 – 06.11.2008. Project reference number PB-2565/T02/2006/31.
9. project within the framework of the Regional Research and Implementation Fund entitled "Computational cluster based on *open-source development* intended for the implementation of computational verification of structural elements using the finite element method", implementation period 06.07.2007 – 31.12.2007. Signature of the IG project. I.3020-UDOT-766/2007.
10. own research project "Experimental verification of the fatigue load disproportionality model", main contractor, 2006 – 2008, PB-2565/T02/2006/31.

11. NCBiR project**:** "Cross-belt system for automated sorting of unit loads using the two-stage method" Project No.: POIR.04.01.04-00-0006/19. – implementation until 2022 – main contractor.
12. currently preparing an application for funding by PARP.

Internal grants of the ATR/UTP University:

1. own research BW-8/96 on: "Measurement of mechanical quantities", implementation in the years 1996 – 2001,
2. statutory research BS-1/96 on "Numerical methods in machine construction, implementation in the years 1996 - 2001,
3. own research BW-11/2002 "Application of numerical methods in machine construction", implementation in 2002 – currently implemented topic,
4. statutory research BS-6/2002 "Measurement of mechanical and thermodynamic quantities", implementation in the years 2002 – 2006,
5. statutory research BS-14/2007 "Tests of structural elements of machines and their control systems", implementation in 2007 – currently implemented topic,

**Other important academic and professional achievements:**

1. Tempus UM JEP 13491-98 project. European Inter-University Cooperation entitled Modernisation of university management & development of structute for international cooperation.. Implementation period: 15.12.1998 – 14.03.2001 (co-management).
2. participation in the implementation of the European Social Fund project "Scholarships for ATR doctoral students in the form of reimbursement of research costs", under the Integrated Regional Operational Programme - priority II - strengthening the development of human resources in the regions, measure 2.6, Regional Innovation Strategies and Knowledge Transfer, implementation in the years 2004 – 2006, project reference number WP. VI.3040-EU-1/2005.
3. member of the team of opinion-givers of the project "Step into the future - scholarships for doctoral students", 2006 – 2010 Toruń, regional assembly of the Kuyavian-Pomeranian Voivodeship,
4. participation in the EU project of the Human Capital Operational Programme "Improving skills and professional qualifications of technical staff in Poland" – postgraduate studies,
5. opinion on the application of the Polytechnic Faculty of the State Higher Vocational School in Kalisz for the right to confer the degree of doctor of technical sciences in the discipline of construction and operation of machines, at the request of the Vice-President of the Council for Science and Higher Education, for the right to confer the degree of doctor of technical sciences in the discipline of construction and operation of machines, 2017.

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# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Izabela Piasecka

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

1. 2020 – Ph.D. degree in mechanical engineering, title of scientific achievement: Study of the *life cycle impact assessment of selected technical facilities of renewable energy, oriented towards the main aspects of sustainable development*, Poznan University of Technology, Faculty of Mechanical Engineering;
2. 2016 – Ph.D. degree in agricultural engineering, title of doctoral dissertation: *Impact of photovoltaic processors on the natural environment*, University of Life Sciences in Lublin, Faculty of Production Engineering;
3. 2014 – Ph.D. degree in the discipline of construction and operation of machines, title of doctoral dissertation: *Study and assessment of the life cycle of wind power plant complexes*, Poznan University of Technology, Faculty of Construction Machinery and Transport.
4. 2018 – postgraduate studies in pedagogical preparation – teaching qualifications, Józef Dietl Małopolska University in Krakow;
5. 2016 – full-time third-cycle (doctoral) studies in the field of agricultural sciences, in the discipline of environmental protection and management, University of Technology and Life Sciences in Bydgoszcz, Faculty of Agriculture and Biotechnology;
6. 2012 – postgraduate studies in the field of construction and operation of renewable energy sources, University of Technology and Life Sciences in Bydgoszcz, Faculty of Mechanical Engineering.

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

1. Subject: Life cycle of machines and processes.

**List of functions of supervisor or assistant supervisor of doctoral dissertations:**

1. Tomasz Cierlicki, in progress since 2020, working title of the dissertation: *Analysis of effective control of the life cycle of a selected technical object of renewable energy in a closed circuit*, Bydgoszcz University of Technology, Faculty of Mechanical Engineering, supervisor.
2. Katarzyna Piotrowska, 2018-2019, dissertation title: *Identification of environmental impacts of car tires in the life cycle*, Poznan University of Technology, Faculty of Transport Engineering, assistant supervisor.
3. Robert Kasner, 2015-2016, dissertation title: *Assessment of benefits and expenditures of the life cycle of a wind power plant*, Poznan University of Technology, Faculty of Construction Machinery and Transport, assistant supervisor.
4. Rafał Śpiewak, 2017-2020, dissertation title: *Determinants of investment efficiency of photovoltaic systems on the electricity market*, University of Gdańsk, Faculty of Economics, assistant supervisor.

5. Łukasz Dysarski, in progress since 2016, dissertation title: *Study of the influence of structural features of a tendon on the performance characteristics of a belt-toothed transport and drive unit*, Bydgoszcz University of Technology, Faculty of Mechanical Engineering, assistant supervisor.

**List of reviews in the procedure for scientific promotion:**
Not applicable.

**List of scientific publications:**


1. Leda P., Piasecka I., Leda A., Szala G., Tomporowski A., Walichnowska P., Bałdowska-Witos P., Kruszelnicka W., 2024: Investigating and Analyzing the Influence of a Solar Power Plant's Life Cycle on the Depletion of Natural Materials and Mineral Resources, Eng, 5(4), 2695-2708.
2. Piotrowska K., Piasecka I., Gola A., Kosicka E., 2024: Assessment of the Impact of Selected Segments of Road Transport on the Natural Environment Using LCA Analysis, Advances in Manufacturing IV, vol 3, Manufacturing 2024, 223-236.
3. Cierlicki T., Zawada M., Piasecka I., Leda P., 2024: Management the efficiency of a photovoltaic installation, Production Engineering Archives, 3, 30.
4. Leda P., Kruszelnicka W., Leda A., Piasecka I., Kłos Z., Tomporowski A., Flizikowski J., Opielak M., 2023: Life Cycle Analysis of a Photovoltaic Power Plant Using the CED Method, Energies, 16(24), 8098.
5. Sobaszek Ł., Piasecka I., Flizikowski J., Tomporowski A., Sokolovskij E., Bałdowska-Witos P., 2023: Environmentally Oriented Analysis of Benefits and Expenditures in the Life Cycle of a Wind Power Plant, Materials, 16(2), 538-557.
6. Leda P., Idzikowski A., Piasecka I., Bałdowska-Witos P., Cierlicki T., Zawada M., 2023: Management of Environmental Life Cycle Impact Assessment of a Photovoltaic Power Plant on the Atmosphere, Water, and Soil Environment, Energies, 16(10), 4230-4256.
7. Piotrowska K., Piasecka I., Kłos Z., Marczuk A., Kasner R., 2022: Assesment of the life cycle oa a wind and photovoltaic power plant in the context of sustainable development of energy systems, Materials, 15(21), 1-25.
8. Piasecka I., Bałdowska-Witos P., Piotrowska K., Kruszelnicka W., Flizikowski J., Tomporowski A., 2021: Ecological life cycle analysis of a 1 MW photovoltaic farm under Polish environmental conditions, Przemysł Chemiczne, 100(1), 40-46.
9. Piotrowska K., Piasecka I., 2021: Specification of Environmental Consequences of the Life Cycle of Selected Post-Production Waste of Wind Power Plants Blades, Materials, 14(17), 4975-5008.
10. Bałdowska-Witos P., Piasecka I., Flizikowski J., Tomporowski A., Idzikowski A., Zawada M., 2021: Life Cycle Assessment of Two Alternative Plastics for Bottle Production, Materials, 14(16), 4552-4573.
11. Piasecka I., Bałdowska-Witos P., Piotrowska K., Kruszelnicka W., Flizikowski J., Tomporowski A., 2021: Ecological life cycle analysis of a 1 MW photovoltaic farm under Polish environmental conditions, Przemysł Chemiczne, 100/1, 40-46.
12. Idzikowski A., Cierlicki T., Bałdowska-Witos P., Piasecka I., 2021: IMPACT WORLD+ a new method for Life Cycle Assessment [in:] Quality Production Improvement QPI 2021 Monograph, De Gruyter Poland, Warsaw.
13. Piotrowska K., Piasecka I., Bałdowska-Witos P., Kruszelnicka W., Tomporowski A., 2020: LCA as a Tool for the Environmental Management of Car Tire Manufacturing, Applied Sciences, 10(20), 7015-7040.

14. Piasecka I., Bałdowska-Witos P., Flizikowski J., Piotrowska K., Tomporowski A., 2020: Control the System and Environment of Post-Production Wind Turbine Blade Waste Using Life Cycle Models. Part 1. Environmental Transformation Models, Polymers, 12(8), 1828-1858.
15. Piasecka I., Bałdowska-Witos P., Piotrowska K., Tomporowski A., 2020: Eco-Energetical Life Cycle Assessment of Materials and Components of Photovoltaic Power Plant, Energies, 13(6), 1385-1409.
16. Piotrowska K., Bałdowska-Witos P., Piasecka I., Kasner R., Kruszelnicka W., Tomporowski A., 2020: Identification of the most important areas of environmental impact in the life cycle of car tires, Przemysł Chemiczne, 99/11, 1593-1599.
17. Piotrowska K., Tomporowski A., Piasecka I., 2020: Eco-innovations of car tires, Monograph, Lublin University of Technology Publishing House, Lublin.
18. Piasecka I., 2019, Study of the life cycle impact assessment of selected renewable energy technical facilities, oriented towards the main aspects of sustainable development, Monograph, University Publishers UTP, Bydgoszcz.
19. Piasecka I., Szymczak M., Olszewski P., 2019: Coffee for specialists and enthusiasts: a study of the assessment of the impact of the stages of the life cycle of coffee plants on the quality of beans and sensory properties of coffee brew, Monograph, University Publishing House, Bydgoszcz.
20. Piasecka I., Tomporowski A., Flizikowski J., Kruszelnicka W., Kasner R., Mroziński A., 2019, Life Cycle Analysis of Ecological Impacts of an Offshore and a Land-Based Wind Power Plant, Applied Sciences, 9(2), 1-15.
21. Tomporowski A., Piasecka I., Mroziński A., Kruszelnicka W., Bałdowska-Witos P., Kovalyshyn S., 2019: The energy use of granulate and pyrolysis oil from discarded car tires as a method to increase ecological and energy safety [in:] System Safety: Human – Technical Facility – Environment, De Gruyter, Częstochowa.
22. Bąk A., Cierlicki T., Piasecka I., 2019, Study and analysis of the multi-roller process of grinding grains of various rice species for energy purposes, Energetyka, 1, 51-55.

**List of patents and protective works:**

1. Flizikowski J., Kruszelnicka W., Bałdowska-Witos P., Kasner R., Tomporowski A., Mroziński A., Piasecka I., Macko M., 2024, patent title: Multi-hole disc-ball mill, patent number: 244924.
2. Flizikowski J., Kruszelnicka W., Bałdowska-Witos P., Kasner R., Tomporowski A., Mroziński A., Piasecka I., Macko M., 2024, patent title: Drum ball and hole mill, patent number: 245085.
3. Tomporowski A., Flizikowski J., Kruszelnicka W., Piasecka I., 2017, patent title: Multi-edge, cylindrical plastic bottle shredder, P.421512.

**List of active participation in conferences:**

1. Piotrowska K., Piasecka I., Gola A., Kosicka E., 2024, paper entitled Assessment of the Impact of Selected Segments of Road Transport on the Natural Environment Using LCA Analysis, Manufacturing 2024, Poznań.
2. Piasecka I., Tokarczyk B., Śpiewak R., 2018, paper entitled Research and analysis of the multi-roller process of crushing for energy purposes of selected cereals with low soil requirements, IV Colloquium on the Development of Advanced Comminution, Bydgoszcz.
3. Piasecka I., Tomporowski A., Ropińska P., 2017, paper entitled Assessment of the impact on the environment of the photovoltaic power plants, CER Conference 2017 – Comparative European Research, London.

4. Piasecka I., Ropińska P., 2017, paper entitled Assessment of the possibility of post-consumer development of photovoltaic energy processors with high installed power, XIX Scientific and Technical Conference Recirculation in Mechanical Engineering. Material, process, system, Bydgoszcz.
5. Piasecka I., Ropińska P., 2017, paper entitled Analysis of the possibility of using crushed grains of selected millet cereals for energy purposes, III Colloquium on the Development of Advanced Grinding, Bydgoszcz.
6. Piasecka I., 2016, paper entitled Ecological and energy analysis of the life cycle of a photovoltaic installation, Eko-Euro-Energia 2016 Conference, Bydgoszcz.
7. Piasecka I., 2015, paper entitled What's next with the use of biomass? Briquettes and pellets in the Kujawsko-Pomorskie Voivodeship, Conference Problem Discussion on the possibilities of development of RES installations in the Kujawsko-Pomorskie Voivodeship – summary of activities, Toruń.
8. Piasecka I., 2015, paper entitled Analysis of the environmental impact of wind farms, Conference Diagnosis of the condition – Problem discussion on the possibilities of development of RES installations in the Kujawsko-Pomorskie Voivodeship, Toruń.
9. Piasecka I., Tomporowski A., Kruszelnicka W., 2015, paper entitled Aspects of recycling photovoltaic module components, Scientific conference Clean energy – technical, economic and social aspects of the functioning of photovoltaic farms, Ustronie Morskie.
10. Piasecka I., 2015, paper entitled Analysis of the possibilities of development of renewable energy sources in the Kujawsko-Pomorskie Voivodeship, III Interdisciplinary Scientific Symposium Science has many names, Bydgoszcz.
11. Piasecka I., Kruszelnicka W., 2015, paper entitled Possibilities of using hybrid sources of electricity in the Kujawsko-Pomorskie Voivodeship, Eko-Euro-Energia 2015 Conference, Bydgoszcz.
12. Piasecka I., 2015, paper entitled Research and assessment of the impact of high-power wind farms on the quality of the natural environment, Eko-Euro-Energia 2015 Conference, Bydgoszcz.

**List of scholarships and scientific internships:**

1. from 31.07.2023 to 29.09.2023 – scientific internship at the Faculty of Mechanical Engineering of the Lublin University of Technology, internship topic: Assessment of the possibility of applying environmental and energy analyses of the life cycle of technical objects in order to transform towards the sustainable development of integrated transport and production, production and processing systems to the requirements of the circular economy.
2. from 27.06.2022 to 30.09.2022 – scientific internship at the Faculty of Mechatronics of the Kazimierz Wielki University in Bydgoszcz, internship topic: Energy and ecological analyses in shredding systems.
3. from 22-02-2021 to 31-03-2021 – industrial internship at Krzemień i Wspólnicy sp. z o.o., Inowrocław, 22 Świętokrzyska Street, internship topic: Analysis of benefits and expenditures in the life cycle of wind farms, taking into account key assumptions of sustainable development.
4. From 23-11-2020 to 18-12-2020 – scientific internship at Lviv National Agrarian University, Faculty of Mechanics and Energy.
5. 2010-2012 – scholarship of the Marshal of the Wielkopolska Region for pupils, listeners and students from the Wielkopolska Region.

**List of participation in scientific grants:**

1. Head of the research task BZ – 90/2018/WIM: Study and granulometric evaluation of crushed coffee beans (UTP in Bydgoszcz, Faculty of Mechanical Engineering).
2. Team member in the Innovation Incubator + program (2018). Project title: Investigation of a mill working assembly with a slab between rollers in order to prepare for implementation (UTP in Bydgoszcz, Faculty of Mechanical Engineering).
3. Team member in the Innovation Incubator + program (2018). Project title: Investigation of the drive and control unit of a multi-disc multi-hole fragment material shredder in order to prepare for implementation (UTP in Bydgoszcz, Faculty of Mechanical Engineering).
4. Active participation in the implementation of research under BZ – 41/2017/WIM: Granulometric analyses of crushed coffee beans (UTP in Bydgoszcz, Faculty of Mechanical Engineering).
5. Principal investigator BSM – 40/2016: Ecological and energy analysis of the life cycle of selected renewable energy installations (UTP in Bydgoszcz, Faculty of Mechanical Engineering).
6. Contractor of the task in the GEKON project (2016) – Development and implementation of a technology for shredding and devulcanization of used car tires for their material and raw material recycling (UTP in Bydgoszcz, Faculty of Mechanical Engineering).
7. Active participation in the implementation of research under BZ – 19/2016/WIM: Investigation of sieve analysis of coffee samples (UTP in Bydgoszcz, Faculty of Mechanical Engineering).
8. Active participation in the implementation of research under BZ – 171/2015/WIM. Investigation of sieve analysis of coffee samples (UTP in Bydgoszcz, Faculty of Mechanical Engineering).
9. European project entitled Energy efficiency for the pro-ecological development of SMEs - postgraduate studies and consulting for companies. The project is implemented under priority II. Measure 2.1. Sub-measure 2.1.1 of the Human Capital Operational Programme. Application No. UDA-POKL.02.01.01-00-390/13. Nature of participation: lecturer.
10. European project entitled Integrated Education in the field of Renewable Energy Sources Engineering at the University of Technology and Life Sciences (UTP) in Bydgoszcz. The project is co-financed by the European Scholarship and Training Fund Programme. Application No. FSS/2014/HEI/W/0078. Nature of participation: lecturer.
11. Active participation in the implementation of research under BS-17/2013 (BS implemented until the end of 2018) – Generation systems taking into account new energy sources and reduction of hazard emissions (UTP in Bydgoszcz, Faculty of Mechanical Engineering).

**Other important academic and professional achievements:**

1. since 2022 – member of the scientific council of the Euroelektra Electrical and Energy Knowledge Olympiad.
2. since 2018, deputy editor-in-chief of the journal Ecology and Technology, Bydgoszcz Scientific Society.
3. 2017-2018 – member of the scientific and organizational committee of the III and IV Colloquium on the Development of Advanced Shredding, Bydgoszcz.
4. 2017 – member of the scientific and organizational committee of the XIX Scientific and Technical Conference Recirculation in Mechanical Engineering. Material, process, system, Bydgoszcz.
5. 2015-2016 – member of the organizing committee of the Eko-Euro-Energia conference, Bydgoszcz.

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# CRITERION 3

## Qualifications of academic teachers or research staff conducting education at the doctoral school

**civil engineering, geodesy and transport**

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**CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER**

**Name:**
Maciej Dutkiewicz

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title: ...**

Discipline: civil engineering, geodesy and transport
2004, PhD degree in civil engineering, Academy of Civil Engineering , Technical and Agricultural Faculty in Bydgoszcz, Faculty of Civil and Environmental Engineering,
2019, habilitation in the field of technical sciences, in the discipline: civil engineering, geodesy and transport, Opole University of Technology, Faculty of Civil Engineering and Architecture

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

1. Wind Engineering
2. New generation concretes and concrete structures

**List of doctoral dissertation supervisor functions:**

- 2 implementation doctorates in preparation
- 2 PhDs in preparation
- 2 PhDs defended

**List of reviews in the procedure for scientific promotion:**
Reviews of doctoral dissertations:

- Agnieszka Kocon Cracow University of Technology
- Aleksander Pistol Cracow University of Technology
- Anna Wojtowicz Wrocław University of Science and Technology
- Barbara Kożuch Cracow University of Technology
- Małgorzata Wydra Wrocław University of Science and Technology
- Michał Kociniak Building Research Institute, Warsaw

List of scientific publications:
https://scholar.google.pl/citations?hl=pl&user=HykzdikAAAAJ&view_op=list_works&sortby=pubdate
http://212.122.198.131/expertus/bib/

Selected publications:

1. Dutkiewicz, M.; Yücel, H.E.; Yıldızhan, F. Evaluation of the Performance of Different Types of Fibrous Concretes Produced by Using Wollastonite. Materials 2022, 15, 6904. https://doi.org/10.3390/ma15196904
2. H.E. Yücel, M Dutkiewicz, F Yıldızhan, The Effect of Waste Ballast Aggregates on Mechanical and Durability Properties of Standard Concrete, Materials 16 (7), 2665, 2022, https://doi.org/10.3390/ma16072665
3. HE Yücel, M Dutkiewicz, F Yıldızhan, Application of ECC as a Repair/Retrofit and Pavement/Bridge Deck Material for Sustainable Structures: A Review, Materials 15 (24),2022, https://doi.org/10.3390/ma15248752

4. Dutkiewicz, M.; Hembara, O.; Chepil, O.; Hrynenko, M.; Hembara, T. A New Energy Approach to Predicting Fracture Resistance in Metals. Materials 2023, 16, 1566. https://doi.org/10.3390/ma16041566
5. T Lamparski, M Dutkiewicz, The Action of Tornadoes on the Structural Elements of a Wooden Low-Rise Building Roof and Surrounding Objects—Review and Case Study, Applied Sciences 13 (8), 4661
6. Soares Fernandes, Y.M.; Rodrigues Machado, M.; Dutkiewicz, M. The Spectral Approach of Love and Mindlin-Herrmann Theory in the Dynamical Simulations of the Tower-Cable Interactions under the Wind and Rain Loads. Energies 2022, 15, 7725. https://doi.org/10.3390/en15207725
7. da Silva Coelho, J., de Sousa, A.A.S.R., Machado, M.R., Dutkiewicz, M. (2023). Study of Machine Learning Techniques for Damage Identification in a Beam. In: Dimitrovová, Z., Biswas, P., Gonçalves, R., Silva, T. (eds) Recent Trends in Wave Mechanics and Vibrations. WMVC 2022. Mechanisms and Machine Science, vol 125. Springer, Cham. https://doi.org/10.1007/978-3-031-15758-5_84
8. Dutkiewicz, M.; Hembara, O.; Ivanytskyi, Y.; Hvozdiuk, M.; Chepil, O.; Hrynenko, M.; Hembara, N. Influence of Hydrogen on the Fracture Resistance of Pre-Strained Steam Generator Steel 22K. Materials 2022, 15, 6596. https://doi.org/10.3390/ma15196596
9. Ozturk, B.; Cetin, H.; Dutkiewicz, M.; Aydin, E.; Noroozinejad Farsangi, E. On the Efficacy of a Novel Optimized Tuned Mass Damper for Minimizing Dynamic Responses of Cantilever Beams. Appl. Sci. 2022, 12, 7878. https://doi.org/10.3390/app12157878
10. Dutkiewicz, M.; Shatskyi, I.; Martsynkiv, O.; Kuzmenko, E. Mechanism of Casing String Curvature Due to Displacement of Surface Strata. Energies 2022, 15, 5031. https://doi.org/10.3390/en15145031
11. Dutkiewicz, M.; Velychkovych, A.; Shatskyi, I.; Shopa, V. Efficient Model of the Interaction of Elastomeric Filler with an Open Shell and a Chrome-Plated Shaft in a Dry Friction Damper. Materials 2022, 15, 4671. https://doi.org/10.3390/ma15134671
12. Pelekhan, B.; Dutkiewicz, M.; Shatskyi, I.; Velychkovych, A.; Rozhko, M.; Pelekhan, L. Analytical Modeling of the Interaction of a Four Implant-Supported Overdenture with Bone Tissue. Materials 2022, 15, 2398. https://doi.org/10.3390/ma15072398
13. Dutkiewicz, M.; Dalyak, T.; Shatskyi, I.; Venhrynyuk, T.; Velychkovych, A. Stress Analysis in Damaged Pipeline with Composite Coating. Appl. Sci. 2021, 11, 10676. https://doi.org/10.3390/app112210676
14. Dutkiewicz M., Machado M.R., Spectral element method in the analysis of vibrations of overhead transmission line in damping environment, Structural Engineering and Mechanics, An International Journal, pages 291-303,2019,
15. Dutkiewicz M., Machado M.R., Measurements in situ and spectral analysis of wind flow effects on overhead transmission lines, Sound and Vibration, Vol.53, No.4, 2019, pp.161-175.
16. Dutkiewicz M., Models of strong wind acting on buildings and infrastructure, IOP Conf. Ser.: Mater. Sci. Eng. 471 (2019) 052030, Proceedings of 3th International Symposium on World Multidisciplinary Civil Engineering, Architecture and Urban Planning, Web of Knowledge & Scopus, ISI Thomson Reuters, 2018, Prague, Czech Republic.
17. Aydin E., Öztürk B., Dutkiewicz M., Analysis of efficiency of passive dampers in multistorey buildings, Journal of Sound and Vibration, vol 439, pages 17-28,2019,
18. Aydin E., Öztürk B., Dutkiewicz M., Optimization of elastic spring supports for cantilever beams, Structural and Multidisciplinary Optimization, 2020,

19. Machado M.R., Dutkiewicz M., Matt C.F.T., Castello D.A., Spectral model and experimental validation of hysteretic and aerodynamic damping in dynamic analysis, Mechanical Systems and Signal Processing, 2020, Volume 136, 106483,
20. Dutkiewicz M., Dalyak T., Shatskyi I., Venhrynyuk T., Velychkovych A., Stress Analysis in Damaged
21. Pipeline with Composite Coating, Appl. Sci. 2021, 11(22),
22. Machado M.R., Dutkiewicz M., Multi-Frequency Broadband Vibration Mitigation of a Beam Under Tensile Load, in review process of Journal of Sound and Vibration,
23. M.Dutkiewicz, M. Machado, Spectral approach of reinforced concrete column dynamics, AVMS Conference, Romania, 2021.
24. Dutkiewicz M., Models of strong wind acting on buildings and infrastructure, IOP Conf. Ser.: Mater. Sci. Eng. 471 (2019) 052030, doi:10.1088/1757-899X/471/5/052030.
25. Dutkiewicz M., Machado M.R., Spectral approach in vibrations of overhead transmission lines, IOP Conf. Series: Mater. Sci. Eng. 471 (2019) 052029, doi:10.1088/1757-899X/471/5/052029.
26. Dutkiewicz M., M.R.Machado, Dynamical response of overhead transmission line in turbulent wind flow with application of the spectral element method, IOP Conf. Ser.: Mater. Sci. Eng. 471 (2019) 052031, doi:10.1088/1757-899X/471/5/052031.

**List of active participation in conferences:**

Selected conferences:

- 68th Krynica Scientific Conference of the Committee on Civil Engineering of the Polish Academy of Sciences and the Science Committee of the Polish Association of Civil Engineering, Gliwice, 2023
- XXIX Conference on Lightweight Structures in Civil Engineering (LSCE 2023), Gdańsk, 2023
- XXVIII Conference on Lightweight Structures in Civil Engineering (LSCE 2022), Poznań, 2023
- 5th Polish Congress of Mechanics, 25th International Conference on Computer Methods in Mechanics, Gliwice, 2023,
- CILAMCE 2023 The XLIV Ibero-Latin American Congress on Computational Methods in Engineering, Porto,
- Multidisciplinary Civil Engineering-Architecture-Urban Planning Symposium, WMCAUS, 2022, 2023, Prague
- Problems OF DYNAMICS AND STRENGTH OF ENGINEERING STRUCTURES, Bydgoszcz, 2024
- WORLD MULTIDISCIPLINARY CONGRESS on Civil Engineering, Architecture and Urban Planning, Ostrava 2024
- Dynamical Systems Theory and Applications, 2017, 2019, Łódź
- Acoustics and Vibration of Mechanical Structures—AVMS-2023, 2021, 2019, Timisoara

**Scientific stays:**

- Sakarya University, Turkey, one-week stay, 2016
- University of Resita, University of Bucharest, Romania, one-week stay, 2017
- Auburn University, USA, 01.2018 - 04.2018
- Buffalo University, USA, one-week stay, 2018
- University of Stavanger, Norway, 2018
- Technical University in Brno, Czech Republic, 2019
- Nigde University, Turkey, 2012, 2019
- Institut National des Sciences Appliquées de Rouen Normandie, France, 2022.

**List of participation in scientific grants:**

- National Science Centre and National Science Foundation, USA, Impress-U program, Principal Investigator, Developing new approaches and structural materials to rebuild damaged Ukrainian infrastructure with environmental sustainability considerations, 2024-2026.
- Horizon EU 2020, Marie Curie Programme, National Science Centre, Scientific supervisor. Design and optimization of smart wind turbines to vibration control and structural monitoring, 2023-2025.
- NCBIR, POIR.01.02.00-00-0223/17 – Testing of the performance properties of B600B reinforcement in reinforced concrete columns. Principal Investigator 2020-2021
- NCBIR, POIR.01.02.00-00-0223/17 - Testing of the performance properties of B600B reinforcement in reinforced concrete slabs. Principal Investigator 2020-2021
- NCBIR, Prestressed nanoconcrete slabs with high-strength reinforcement. Project manager, 2023-2024.
- Project: Effect of crumb pile on macrotexture and strength of concrete. 2021-2023. Incubator 4.0. Project Manager
- Projekt, 2008-2009, Modeling and numerical simulation of vibrations of the ground medium caused by the movement of the train and their impact on neighboring buildings". The project is carried out in cooperation with the University of Ningbo in China. Project manager from the Polish side
- Project NAWA, PPN/SZN/2020/1/00025/U/00001, Solidarity with Belarus, Project Manager.2021-2022
- Project NAWA, Functional Manager - A.I. am here – Digital-based business as a path for the sustainable building sector, 2021-2023,

**Other important academic and professional achievements:**

- Dean of the Faculty of Civil Engineering, Architecture and Environmental Engineering,
- Head of the Department of Building Structures and Mechanics,
- Member of the Scientific Council of the Doctoral School of the Silesian University of Technology,
- Member of the Council for the Discipline of Civil Engineering, Geodesy and Transport,
- Chair of the ISO/TC 98 Programme Group, Structural Reliability
- Member of the International Association of Shell and Spatial Structures,
- Member of the Polish Association for Wind Engineering,
- Expert of the Polish Committee for Standardization of Committees: KT 102 Fundamentals of Designing Building Structures, KT 213 Fundamentals of Design and Execution of Concrete Structures,
- Member of PZiTB,
- Master of Law, 2013
- Designer, advisor to the management board and director in joint-stock companies, 1995-2015
- Since 1999, he has had a building licence to manage construction works in the construction and construction specialisation without restrictions.
- Since 2000, he has had a building licence to design in the construction and construction specialty without restrictions, author and co-author of designs of building structures, including the Niederaussem power plant in Germany
- Author of expert opinions and court opinions.

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# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Jarosław Górecki

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

Ph.D. – technical sciences, construction, 2014

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

1. A block of subjects from the discipline of civil engineering and transport to choose from:
2. Managing construction projects from a sustainable perspective

**List of functions of supervisor or assistant supervisor of doctoral dissertations:**
Assistant supervisor – PhD of Paweł Majkowski, MSc Eng.

**List of reviews in the procedure for scientific promotion:**

| University | Locality | Department |
|---|---|---|
| University of Castilla-La Mancha | Ciudad Real | Escuela Técnica Superior de Ingeniería de Caminos, Canales y Puertos |
| University of Salerno | Fisciano | Department of Civil Engineering |
| University Sindh | Jamshoro | Research and Graduate Studies |
| University Sindh | Jamshoro | Research and Graduate Studies |
| University Sindh | Jamshoro | Research and Graduate Studies |
| University Sindh | Jamshoro | Research and Graduate Studies |

**List of scientific publications:**

1. Year: 2023; Authors: Liu Huanbao, Li Zihan, Skibniewski Mirosław J., Wang Liang, Cong Xuhui, Górecki Jarosław, Jin Wenyu; Title: Molding quality control with nonlinear forming method in 3D cement printing; Journal: Materials & Design; Impact Factor: 7.600; Total score of the Ministry of Science and Higher Education: 140,000
2. Year: 2023; Authors: Adiguzel Istil Seyda, Górecki Jarosław, Diemer Arnaud; Title: Study on Certification Criteria of Building Energy and Environmental Performance in the Context of Achieving Climate Neutrality; Journal: Sustainability; Impact Factor: 3,300; Total score of the Ministry of Science and Higher Education: 100,000
3. Year: 2022; Authors: Górecki Jarosław, Núñez-Cacho Pedro; Title: Decision-Making Problems in Construction Projects Executed under the Principles of Sustainable Development—Bridge Construction Case; Journal: Applied Sciences; Impact Factor: 2,700; Total score of the Ministry of Science and Higher Education: 100,000
4. Year: 2022; Authors: Keles Abdullah Emre, Önen Ecem, Górecki Jarosław; Title: Determination of Green Building Awareness: A Study in Turkey; Journal: Sustainability; Impact Factor: 3.900; Total score of the Ministry of Science and Higher Education: 100,000

5. Year: 2022; Authors: Górecki Jarosław, Bojarowicz Ewa, Bizon-Górecka Jadwiga, Zaman Umer, Keleş Abdullah Emre; Title: Leadership models in era of new technological challenges in construction projects; Journal: PLoS One; Impact Factor: 3,700; Total score of the Ministry of Science and Higher Education: 100,000
6. Year: 2022; Authors: Górecki Jarosław, Núñez-Cacho Pedro, Rutkowska Milena; Title: Study on Circular Economy Implementation Propensity of Construction Companies in Context of Prevailing Management Styles; Journal: Applied Sciences; Impact Factor: 2,700; Total score of the Ministry of Science and Higher Education: 100,000
7. Year: 2021; Authors: Shehzad Khurram, Zaman Umer, Liu Xiaoxing, Górecki Jarosław, Pugnetti Carlo; Title: Examining the Asymmetric Impact of COVID-19 Pandemic and Global Financial Crisis on Dow Jones and Oil Price Shock; Journal: Sustainability; Impact Factor: 3.889; Total score of the Ministry of Science and Higher Education: 100,000
8. Year: 2021; Authors: Cong Xuhui, Ma Li, Wang Liang, Šaparauskas Jonas, Górecki Jarosław, Skibniewski Mirosław J.; Title: The Early Warning System for determining the "Not In My Back Yard" of Heavy Pollution Projects based on Public Perception; Journal: Journal of Cleaner Production; Impact Factor: 11.072; Total score of the Ministry of Science and Higher Education: 140,000
9. Year: 2021; Authors: Rahman Habib your, Zaman Umer, Górecki Jarosław; Title: The Role of Energy Consumption, Economic Growth and Globalization in Environmental Degradation: Empirical Evidence from the BRICS Region; Journal: Sustainability; Impact Factor: 3.889; Total score of the Ministry of Science and Higher Education: 100,000
10. Year: 2020; Authors: Górecki Jarosław, Díaz-Madroñero Manuel; Title: Who Risks and Wins?—Simulated Cost Variance in Sustainable Construction Projects; Journal: Sustainability; Impact Factor: 3.251; Total score of the Ministry of Science and Higher Education: 100,000

**List of patents and protective works:**
lack

**List of active participation in conferences (from the last 3 years):**

| Conference name | City | Year | Organizer |
|---|---|---|---|
| El fondo Europeo de defensa: retos y oportunidades para las empresas Andaluzas | Linares | 2023 | Escuela Politécnica Superior de Linares, Universidad de Jaén |
| 2nd Zero Waste Technologies Seminar | Bydgoszcz | 2023 | J. J. Śniadecki Bydgoszcz University of Technology |
| ISViS 2023: II Congreso Internacional sobre Innovación y Sostenibilidad en la Vivienda Social | Granada | 2023 | Universidad de Granada, Junta de Andalucía |
| Bucharest : IEEE, 2023 | Bucharest | 2023 | University Politehnica of Bucharest |
| Green Deal, Industrial Ecology and Circular Economy | Clermont-ferrand | 2024 | UCA, UMR CERDI, ERASME |

**List of scholarships and scientific internships:**

| Mobility Type | Host institution | City | Year |
|---|---|---|---|
| Study stay | Universidad de Granada | Granada | 2017 |
| Study stay | Universidad de Granada | Granada | 2018 |

| Mobility Type | Host institution | City | Year |
|---|---|---|---|
| Study stay | Universidad de Granada | Granada | 2019 |
| Scientific internship as part of the program to improve the qualifications of university staff | Universidad de Jaén | Linares | 2021 |
| French Government Scholarship - Bourses du Gouvernement Français | University of Clermont Auvergne | Clermont -ferrand | 2022 |

**List of participation in scientific grants:**

| Title | Financing institution | Role | Details | Implementation period |
|---|---|---|---|---|
| Investigating the lifecycle risks of construction investment projects with sustainability in mind | University of Technology and Life Sciences in Bydgoszcz | Project Manager | BSM-61/2018 | 2018-2019 |
| Diversification of the risk of construction project costs | University of Technology and Life Sciences in Bydgoszcz | Project Manager | BSM-52/2013 | 2013-2018 |
| Determinants of the success of construction companies as participants in projects implemented in international cooperation | Ministry of Science and Higher Education | Participant | Own research project No. N N115 048635 – contract No. 0486/B/H03/2008/35 | 2008-2011 |
| Project management | University of Technology and Life Sciences in Bydgoszcz | Participant | BW-9/2007 | 2007 |
| Modeling the structure of the risk management system in an enterprise – a holistic approach | Ministry of Science and Higher Education | Participant | Own research project No. 1 H02D 033 27 – contract No. 0276/H02/2004/27 | 2004-2007 |
| Innovation risk – strategies of enterprises in the Kujawsko-Pomorskie Voivodeship | Regional Fund for Research and Implementation of the Kujawsko-Pomorskie Voivodeship | Participant | Contract No. GP. I.3020-UDOT-917/2006 | 2006 |

**Other important academic and professional achievements:**

| Participation in the evaluation process | Activity in the Polish Chamber of Civil Engineers | Activity in the Polish Association of Construction Engineers and Technicians | Other |
|---|---|---|---|
| V call for targeted grants (evaluation of the application in 2023) | since 2010 | since 2012 | Expert witness since 2014. |
| Calls for proposals under the programme. Participation in panels:<br>1. MSP Fast Track<br>2. Application projects | Member of the BIM Team at RK PIIB | Chairman of the Board of the Bydgoszcz Branch of PZITB | Web of Science Researcher ID E-5343-2015 |
| Ulam Programme, NAWA | | Member of the PZITB Science Committee | https://orcid.org/0000-0001-6829-3127 |

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Maria Wesołowska

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

1991 – M.Sc. Eng. in Civil Engineering
2000 – Ph.D. Eng. in the field of technical sciences in the discipline of civil engineering, with a scientific specialization in building physics
2017 – Ph.D. in the field of technical sciences in the discipline of civil engineering

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**
Protecting building partitions from environmental impacts

**List of functions of supervisor or assistant supervisor of doctoral dissertations:**

1. Supervisor: 2023 – Monika Dybowska-Józefiak: Identification of factors determining the durability and aesthetics of building facades
2. Assistant supervisor: 2019 - Analytical and experimental method of designing concretes with EPS regranulate

**List of reviews in the procedure for scientific promotion:**
Habilitation proceedings:

1. 2022 – Barbara Francke: The impact of the durability of waterproofing solutions on ensuring the protection of buildings against water and moisture

Doctoral dissertations:

1. 2020 – Daniel Tokarski: Effect of supplementary layer with biochar addition on thermal properties and mycological hazards of partitions in historic buildings
2. 2022 - Maria Tunkiewicz: Redistribution of moisture in internal insulation layers made on damp proofing of the white bathtub type
3. 2023 – Joanna Borowska: Optimization of window joinery parameters of residential buildings based on mathematical modeling of heat flow
4. 2024 Piotr Koda: Internal microclimate of historic buildings in different conditions of use

**List of scientific publications:**

1. Dybowska-Józefiak M, Wesołowska M.: The influence of selected plaster coatings on the thermal performance of an ETICS system Budownictwo o Optimized Energy Potential 2023
2. Dybowska-Józefiak M, Wesołowska M.: Abiotic internal factors influencing the development of biocorrosion on ETICS system plasters. Materials 2022. DOI: 10.3390/MA15010127
3. Wesołowska M, Kaczmarek A.: Evaluation of Frost Impact on Traditional Ceramic Building Materials Utilized in Facing Walls Materials 2022, doi: 10.3390/ma15165653
4. Dybowska-Józefiak M, Wesołowska M.: The Influence of Biofilm on Selected Properties of Thin-

Coat Mineral-Based Plasters on EPS Substrate Materials 2022, doi: 10.3390/ma15175963
5. Wesołowska M.: Department of General Construction and Structural Physics University of Technology and Life Sciences in Bydgoszcz (currently Bydgoszcz University of Technology) Physics of buildings in Poland: Scientific centers, their potential and achievements / ed. Halina Garbalińska, Dariusz Gawin, Henryk Nowak, Łódź : Lodz University of Technology, 2021
6. Wesołowska M, Kaczmarek A, Hoła J.: The Influence of External Environmental Conditions on Properties of Ceramic Building Materials with Waste Material Additives Materials 2021. DOI: 10.3390/MA14112982
7. Wesołowska M, Szkuta T. Are mineral toppings of asphalt roofing sufficient to protect flat roofs and roofing felt alone? Proceedings of the XV edition of the International Conference on Durability of Building Materials and Components / eds. Carles Serrat, Joan Ramon Casas, Vicente Gibert, Barcelona: International Center for Numerical Methods in Engineering (CIMNE), 2020
8. Wesołowska M.: Humidity consequences for the application of the contemporary repairs into historic walls. Brick and Block Masonry - From Historical to Sustainable Masonry / Editors: Jan Kubica, Arkadiusz Kwiecień & Łukasz Bednarz Leiden: CRC Press/Balkema, 2020 doi: 10.1201/9781003098508
9. Wesołowska M.: Microstructure ceramic changes resulting from sodium sulphate subflorescence. IOP Conference Series-Materials Science and Engineering 2019, doi:10.1088/1757-899X/471/3/032031
10. Wesołowska M.: Protection against degradation of contemporary face walls IOP Conference Series: Materials Science and Engineering, 2019, doi: 10.1088/1757-899X/471/3/032032
11. Szkuta T, Wesołowska M.: Effects of physical phenomena on flat roofs. Part I - Irregularities, analysis of the condition. Przegląd Budowlany 2019, No. 7-8, pp. 103-105
12. Wesołowska M, Szczepaniak P, Pawłowski K, Kaczmarek A.: Physical issues in thermal modernization and renovation of buildings Bydgoszcz: University Publishing Houses UTP, 2019
13. Wesołowska M, Szczepaniak P, Gajewski J. NZEBs built of elements based on styrofoam re-granulate IOP Conference Series: Materials Science and Engineering 2018, doi: 10.1088/1757-899X/415/1/012004
14. Wesołowska M, Mrozik Ł, Gajewski J, Grzybowska A, Piekarski P, Szczepaniak P, Janicki J.: Prefabricated wall elements made of polystyrene concrete composites - from idea to prototype. Building Materials 2018, No. 12, pp. 32-33, doi: 10.15199/33.2018.12.10
15. Sowiński M, Wesołowska M, Żołnierczyk J, Matuszczak M.: The role of field surveys in the evaluation of the new passive house system. Izolyati 2018, No. 11/12, pp. 46-51
16. Wesołowska M.: The quality of wall element junction with mortar as the basic condition for structural integrity of facing Wall Proceedings of the International Masonry Society Conferences 2018, pp. 1361-1370
17. Wesołowska M.: Changes in the microstructure of ceramics resulting from subflorescence of sodium sulfate. Physics of Buildings in Theory and Practice 2018, vol. X, no. 1, pp. 45-49
18. Wesołowska M, Kaczmarek A.: Dependence of Capillary Properties of Contemporary Clinker Bricks on Their Microstructure IOP Conference Series: Materials Science and Engineering 2017, doi: 10.1088/1757-899X/245/2/022045
19. Wesołowska M, Kaczmarek A.: Evaluation of clinker microstructure changes resulting from different subsoil contacts after long-term exposition to Polish climate conditions. INTERNATIONAL CONFERENCE ON ANALYTICAL MODELS AND NEW CONCEPTS IN CONCRETE AND MASONRY STRUCTURES / ed. Kubica J. Netherlands: Elsevier, 2017 pp. 192-197 doi: 10.1016/j.proeng.2017.06.203
20. Kaczmarek A, Wesołowska M.: Factors affecting humidity conditions of a face wall layer of a

heated building. INTERNATIONAL CONFERENCE ON ANALYTICAL MODELS AND NEW CONCEPTS IN CONCRETE AND MASONRY STRUCTURES / ed. Kubica J. Netherlands: Elsevier, 2017 pp. 205-210 doi: 10.1016/j.proeng.2017.06.205

21. Szczepaniak P, Wesołowska M.: Thermal and humidity consequences of the change in the nature of use of an industrial building with a light flat roof. Building Materials 2017, No. 11, pp. 116-117 doi: 10.15199/33.2017.11.47
22. Wesołowska M.: The role of mortar microstructure in providing the face wall structural integrity. INTERNATIONAL CONFERENCE ON ANALYTICAL MODELS AND NEW CONCEPTS IN CONCRETE AND MASONRY STRUCTURES / ed. Kubica J. Amsterdam: ELSEVIER SCIENCE BV, 2017 pp. 198-204 doi:10.1016/j.proeng.2017.06.204
23. Kaczmarek A, Wesołowska M.: Effect of route addition on the tightness of the connection between the masonry element and the mortar. Building Materials 2017, No. 5, pp. 73-74, doi:10.15199/33.2017.05.30
24. Wesołowska M, Szczepaniak P.: Thermal protection of construction nodes after uncontrolled renovation of a historic villa. Building Materials 2017, No. 11, pp. 126-127, doi: 10.15199/33.2017.11.51
25. Wesołowska M.: Protection of facing walls against environmental influences. Monograph. University Publishing House UTP 2016.
26. Wesołowska M., Pawłowski K.: Aspects related to the adaptation of existing buildings to the standards of energy-efficient construction. Bydgoszcz, TOP Advertising Agency, 2016.
27. Wesołowska M.: Influence of selected mortars on the integrity of facing walls. Brick and Block Masonry. Trends, Innovations and Challenges, ed. C. Modena, F. da Porto & M.R. Valluzzi, Taylor & Francis Group 2016, pp.581-587.
28. Wesołowska M., Kaczmarek A.: Efflorescence formation on external masonry walls – a long-term exposure study Brick and Block Masonry. Trends, Innovations and Challenges, ed. C. Modena, F. da Porto & M.R. Valluzzi, Taylor & Francis Group 2016, pp. 575-580.
29. Wesołowska M., Kaczmarek A.: Selection of mortar for clinker facing walls - a proposal of methodology. Selected issues of revitalization of buildings / Work collection. edited by K. Kamiński and W. Kubiss. Płock, Warsaw University of Technology, Branch in Płock, 2014, pp.149-158.
30. Wesołowska M., Szczepaniak P.: Building components shaping the heat demand in selected permanent formwork systems. Selected Problems of Construction, University Publishing House, UTP, Bydgoszcz 2015, pp. 55-61
31. Wesołowska M., Kaczmarek A., Leszczyński T.: Microstructure of clinker brick pores in masonry elements subjected to natural external climate. Selected problems of construction. Collective work edited by J. Sobczak-Piąstka, University Publishing House, Bydgoszcz 2015, pp.47-54.
32. Wesołowska M., Kaczmarek A.: The influence of selected environmental factors on the development of salt efflorescence on contemporary facing wallsSelected problems of construction. Bydgoszcz. Collective work edited by J. Sobczak-Piąstka, University Publishing House, Bydgoszcz 2015, pp. 25-32
33. Kaczmarek A. Wesołowska M.: The microstructure of selected mortars undergoing long-term influence of external environment. Procedia Engineering 161 (2016), pp.931-936, http://dx.doi.org/10.1016/j.proeng.2016.08.569.
34. Wesołowska M., Kaczmarek A.: Changes of Clinker Microstructure After Long-Term Influence of External Environment. Procedia Engineering 161 (2016), pp.: 337-342, http://dx.doi.org/10.1016/j.proeng.2016.08.569
35. Wesołowska M., Kaczmarek A.: Dependence of Capillary Properties of Contemporary Clinker Bricks on Their Microstructure. Materials Science and Engineering (2017), vol. 245, pp. 1-6,

DOI: 10.1088/1757-899X/245/2/022045

36. Wesołowska M., Kaczmarek A.: Evaluation of clinker microstructure changes resulting from different subsoil contacts after long-term exposition to Polish climate conditions. Procedia Engineering (2017), pp. 192-197, DOI: 10.1016/j.proeng. 2017.06.203
37. Wesołowska M., Kaczmarek A.: The effect of modifications on humidity parameters of cement mortar Materials Science Forum, Vol. 865, pp.178-182 doi:10.4028/www.scientific.net/MSF.865.178. © 2016 Trans Tech Publications, Switzerland.
38. Kaczmarek A., Wesołowska M.: Selected Factors Determining Appearing of Efflorescences on Facial Walls. Materials Science Forum, Vol. 865, pp.183-189 doi:10.4028/www.scientific.net/MSF.865.183 Online: 2016-08-10. © 2016 Trans Tech Publications, Switzerland.
39. aczmarek A., Wesołowska M.: Destruction of the wall in historic railway bridges in Bydgoszcz. Journal: Logistyka - 2014, pp.5053-5058.
40. Wesołowska M., Kaczmarek A.: The influence of mortars on the quality of brick bridge structures. Materiały Budowlane 7/2014, pp.64-65.
41. Wesołowska M., Szczepaniak P.: Selected problems of thermal bridges in contemporary multi-occupancy buildings. Technical Journal. Technical Translations 111/2014 , Issue 3-B (8), pp.481-488.
42. Wesołowska M.: The role of mortar in shaping the integrity of the facing wall: Physics of buildings in theory and practice - 2015, vol. VII, no. 4, pp.39-43.
43. Wesołowska M., Szczepaniak P.: Consequences of introducing a garage function into the basement of a multi-family building. Building Materials No. 11/2015, pp.183-184.
44. Wesołowska M., Szczepaniak P.: Shaping of the ground connection node in a low-energy system building. Materiały Budowlane 5/2015, pp. 88-90.
45. Wesołowska M., Kaczmarek A.: Influence of structure on moisture parameters of selected building mortars. Materiały Budowlane 5/2015, pp. 67-68.
46. Wesołowska M., Kaczmarek A.: The influence of the surface shape of the facing wall on its aesthetics. Materiały Budowlane 5/2015, pp. 71-72.
47. Wesołowska M.: Protection against moisture of historic military objects intended for adaptation. Materiały Budowlane 11/2015, pp.181-182.
48. Wesołowska M., Szczepaniak P.: The influence of insulating permanent formwork on the energy properties of buildings. Materiały Budowlane 2/2016, pp.24-25.
49. Kaczmarek A., Wesołowska M.: Drying time of single-layer walls from technological moisture, Materiały Budowlane 3/2016, pp.52-53.
50. Wesołowska M.: The analysis of facing wall construction date on its humidity condition. Proceedings of the Central European Symposium on Building Physics and BauSIM 2016. Dresden 2016.
51. Dybowska-Józefiak M., Pawłowski K. , Wesołowska M.: Numerical analysis of thermal and humidity parameters of joints of external walls with balcony slabs in the light of new thermal requirements, Construction and Environmental Engineering - 2016, vol. 7, no 2, pp.71-80.

**List of patents and protective works:**

1. 003633676-0001 Building blocks industrial design international
2. 241821 Pre-insulated heating pipeline and its manufacturing method patent Polish

**List of active participation in conferences:**

1. 8th International Masonry Conference Dresden 2010. Innovative Solutions for Sustainable Masonry Construction., Wesołowska M., Pawełkowski K., Kempiński M., Kaczmarek M.: Compatibility of masonry components from gas permeability tests (wygłosnie).

2. 5th International Conference on Autoclaved Aerated Concrete: "Securing a sustainable future" to be held at Bydgoszcz to celebrate 60 years of AAC experience in Poland. Bydgoszcz 2011., Wesołowska M., Pawłowski K., Kaczmarek A., Kończal K.: Exploitation Problems of Single Layer Walls of Autoclave Cellular Concrete (poster).
3. 3rd International Conference Binders and Materials. Brno 2015, Wesołowska M., A. Kaczmarek: The effect of modifications on humidity parameters of cement mortar (presentation), A. Kaczmarek, Wesołowska M.: Selected factors determining appearing of efflorescences on facing walls (presentation)
4. World Multidisciplinary Civil Engineering-Architecture-Urban Planning WMCAUS 2016, Prague 2016. , M. Wesołowska, A. Kaczmarek: Changes of clinker microstructure after long-term influence of external environment (poster), A. Kaczmarek, M. Wesołowska: The microstructure of selected mortars undergoing long-term influence of external environment (poster)
5. XVI International Brick and Block Masonry Conference. Masonry in a world of challenges. Padua 2016, Wesołowska M., Kaczmarek A.: Efflorescence formation on external masonry walls – A long-term exposure study (poster), Wesołowska M.: Influence of selected mortars on the integrity of facing walls(wygłose)
6. Central European Symposium on Building Physics CESBP 2016. Dresden2016r., Wesołowska M.: The analysis of facing wall construction date on its humidity condition (poster)
7. 9th International Conference AMCM'2017 : Analytical Models and New Concepts in Concrete and Masonry Structures Gliwice, June 5-7, 2017, Wesołowska M., Kaczmarek A.: Evaluation of clinker microstructure changes resulting from different subsoil contacts after long-term exposition to Polish climate conditions (speech), Kaczmarek A. Wesołowska M.: Factors affecting humidity conditions of a face wall layer of a heated building (presentation). , Wesołowska M.:The role of mortar microstructure in providing the face wall structural integrity (wygłosnie).
8. World Multidisciplinary Civil Engineering-Architecture-Urban Planning WMCAUS 2017, Praga 2017 , Wesołowska M., Kaczmarek A.: Dependence of Capillary Properties of Contemporary Clinker Bricks on Their Microstructure (poster).
9. Protection of Buildings against Moisture and Pressure Water, IV Scientific and Technical Conference Olsztyn 2018, Wesołowska M.: Prevention of degradation of facing walls (speech)
10. World Multidisciplinary Civil Engineering-Architecture-Urban Planning WMCAUS 2017, Praga 2018 , Wesołowska M.: Microstructure Ceramic Changes Resulting from Sodium Sulphate Subflorescence (presentation), Wesołowska M.: Protection against degradation of contemporary face walls (poster)
11. International Conference on Durability of Building Materials and Components Barcelona 2020r. , Wesołowska M., Szkuta T.: re mineral toppings of asphalt roofing sufficient to protect flat roofs and roofing felt alone? (speech)
12. 10 International Masonry Conference Milan 2018r., Wesołowska M. The quality of wall element junction with mortar as the basic condition for structural integrity of facing Wall (speech)
13. 17th International Brick and Block Masonry Conference Kraków 2020, Wesołowska M.: Humidity consequences for the application of the contemporary repairs into historic walls (speech)
14. Problems of design, implementation and operation of buildings with low energy demand Energodom 2022, Dybowska-Józefiak M., Kaczmarek A., Wesołowska M.: The impact of plastering on the thermal insulation of the system (presentation)
15. XVI Scientific and Technical Conference REMO 2022, Dybowska-Józefiak M., Wesołowska M.: The influence of biofilm on selected properties of thin-coat mineral-based plasters on EPS substrate

**List of scholarships and scientific internships:**
lack

**List of participation in scientific grants:**
R+D research:

1. VB/01/2014/091 - Introduction of eco-innovation to energy-saving technology of the EKOBUD type – project manager
2. VB/01/2014/090 - A comprehensive system for erecting energy-efficient and passive buildings, based on expanded clay concrete elements – project manager
3. POIR.02.02.02-04-0015/16 - Large-block insulating and structural wall elements and a frame structure in insulating permanent formwork intended for erecting walls of low-energy and passive buildings – project manager
4. POIR.02.03.02-04-0031/20 - Development of innovative pre-insulated pipelines commissioned by SYNCO Sp. z o.o., Sp. K - project manager

**Other important academic and professional achievements:**

1. Distinction of the Minister of Regional Development and Construction for his doctoral dissertation in 2000 for a comprehensive, theoretical and experimental diagnosis of the problem, of significant practical importance, Warsaw 2001.
2. In the years 2009-2018, co-implementation of the second stage of the Regional Innovation Center, established at the University of Technology and Life Sciences in Bydgoszcz: development of the concept of the functioning of the Laboratory of Advanced Research of Materials and Processes of Heat and Mass Flow included in the structure of the Laboratory of Materials and Building Structures, organization of the laboratory, head of the laboratory.
3. Chairwoman of the problem part of the 61. Scientific Conference of the Committee on Civil Engineering of the Polish Academy of Sciences and the Science Committee of the Polish Association of Construction Engineers and Technicians in Krynica entitled "Energy-efficient construction in Poland – state and prospects". 2015. A monograph edited by nauk. M. Wesołowska.

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Justyna Sobczak-Piąstka

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

Master of Science in Civil Engineering, Technical Sciences: 1994
Doctor of Engineering in Civil Engineering: 2002
Currently represented field: engineering and technical sciences
Currently represented discipline: civil engineering, geodesy and transport

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

Durability of building structures – a subject to choose from the block of subjects from the discipline of civil engineering, geodesy and transport

**List of functions of supervisor or assistant supervisor of doctoral dissertations:**

1. Assistant supervisor in the doctoral dissertation "Computational and functional model of a solar chimney supporting gravitational ventilation in buildings", Magdalena Nakielska, MSc; University of Technology and Life Sciences in Bydgoszcz, Faculty of Civil Engineering, Architecture and Environmental Engineering, defence 2016.
2. Assistant supervisor in the doctoral dissertation "Modeling of structure stability using the finite element method", Izabela Kasprzyk, M.Sc., Eng., Jan and Jędrzej Śniadecki University of Technology and Life Sciences in Bydgoszcz, Faculty of Civil Engineering, Architecture and Environmental Engineering, defense 2023.

**List of reviews in the procedure for scientific promotion:**
lack

**List of scientific publications:**

1. Sobczak-Piąstka Justyna, Demchyna Bogdan, Kozak Roman, Majcher Paula, Niemiec Janusz, Assessment of the effect of lateral loss of stability for flat glass beams, In: Proceedings of the 11th International Conference on Applied Mechanics, American Institute of Physics, Series: AIP Conference Proceedings, 2949; 2023, DOI:10.1063/5.0165283
2. Sobczak-Piąstka Justyna, Pavluk Andrii, Gomon Svyatoslav S., Gomon Petro, Homon Sviatoslav, Lynnyk Iryna, Changing the position of the neutral line of beams made of glued wood in conditions of oblique bending, In: World Multidisciplinary Civil Engineering-Architecture-Urban Planning Symposium WMCAUS 2022, Series: AIP Conference Proceedings; 2928; No. 080007, 2023, DOI: 10.1063/5.0170371
3. Sobczak-Piąstka Justyna, Yevhenij Babich, Bohdan Karavan, Experimental studies of a reinforced concrete arch made of high-strength concrete on the action of low-cycle loads, Journal: Materiały Budowlane, 2023, 6, 19-22, DOI: 10.15199/33.2023.06.05

4. Sobczak-Piąstka Justyna, Babych Volodymyr, Karavan Victor, Polianovska Olena, Filipchuk Sergij, Shvets Igor, Increase in crack resistance of bending reinforced-concrete elements by local dispersal reinforcement of the tensile zone, In: World Multidisciplinary Civil Engineering-Architecture-Urban Planning Symposium WMCAUS 2022, AIP Publishing, Series: AIP Conference Proceedings; 2928; No. 080006, 2023, DOI: 10.1063/5.0170370
5. Delyavskyy Mykhaylo, Sobczak-Piąstka Justyna, Rosiński Krystian, Buchaniec Dariusz, Famulyak Yuri, Solution of thin rectangular plates with various boundary conditions, In: Proceedings of the 11th International Conference on Applied Mechanics, American Institute of Physics, Series: AIP Conference Proceedings; 2949; 2023, DOI: 10.1063/5.0165300
6. Sobczak-Piąstka Justyna, Famulyak Yuriy, Demchyna Bogdan, The application of non-traditional reinforcement in structural elements made of cellular concrete, In: Proceedings of the 11th International Conference on Applied Mechanics, American Institute of Physics, Series: AIP Conference Proceedings; 2949; 2023, DOI:10.1063/5.0165301
7. Kiuntsli Romana, Stepaniuk Andriy, Sobczak-Piąstka Justyna, The Paradox of the Beautiful or the Art Paradox, in: World Multidisciplinary Civil Engineering-Architecture-Urban Planning Symposium WMCAUS 2022, series: AIP Conference Proceedings; 2928; 2023, No. 020001, DOI: 10.1063/5.0170369
8. Podhorecki Adam, Sobczak-Piąstka Justyna, Lachowicz Magdalena, On the principles of determining the usable floor area in residential buildings, Czasopismo Materiały Budowlane, 02/2022, pp. 49-51, 2022, doi: 10.15199/33.2022.02.09
9. Justyna Sobczak-Piąstka, Andrii Pavluk, Svyatoslav S. Gomon, Petro Gomon, Sviatoslav Homon, Iryna Lynnyk, Changing the position of the neutral line of beams made of glued wood in conditions of oblique bending, WMCAUS 2022
10. Justyna Sobczak-Piąstka, Romana Kuntsli, Andriy Stepanyuk, The paradox of the beautiful or the art paradox, WMCAUS 2022
11. Justyna Sobczak-Piąstka, Volodymyr Babych, Victor Karavan, Olena Polianovska, Sergij Filipchuk, Igor Shvets, Increase in crack resistance of bending reinforced-concrete elements by local dispersal reinforcement of the tensile zone, WMCAUS 2022
12. Софія Бурченя, Юстина Собчак-Пястка, ОСНОВНІ ЕТАПИ ПРОВЕДЕННЯ ОБСТЕЖЕНЬ БУДІВЕЛЬ ТА СПОРУД ПОШКОДЖЕНИХ ВНАСЛІДОК НАДЗВИЧАЙНИХ СИТУАЦІЙ, БОЙОВИХ ДІЙ ТА ТЕРОРИСТИЧНИХ АКТІВ, УДК 69.059, МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ, ЛЬВІВСЬКИЙ НАЦІОНАЛЬНИЙ АГРАРНИЙ УНІВЕРСИТЕТ, V МІЖНАРОДНА НАУКОВО-ТЕХНІЧНА КОНФЕРЕНЦІЯ ЕФЕКТИВНІ ТЕХНОЛОГІЇ І КОНСТРУКЦІЇ В БУДІВНИЦТВІ ТА АРХІТЕКТУРА СЕЛА, ТЕЗИ ДОПОВІДЕЙ, Львів 16-17 червня 2022, с. 22-23
13. Sobczak-Piąstka Justyna, Lachowicz Magdalena, Podhorecki Adam, Selected problems regarding the technical assessment of building structures, Materiały Budowlane Magazine, 02/2021, pp. 46-48, 2021
14. Sobczak-Piąstka Justyna, Dampness of panel buildings, Czasopismo Materiały Budowlane, 05/2021, pp. 55-57, 2021
15. Justyna Sobczak-Piąstka, Oksana Kichaeva, Pavlo Firsov, Sergey Zolotov, Yuriy Famulyak, Management of the "building-base system" action, using a life cycle model, Scientific Reports, (2021) 11:18790, https://doi.org/10.1038/s41598-021-98367-0, accessed https://rdcu.be/cyd7r
16. Justyna Sobczak-Piąstka, Svyatoslav S. Gomon, Mykola Polishchuk, Sviatoslav Homon, Petro Gomon, Victor Karavan "Method of testing a bendable beam made of glued laminated timber with mixed reinforcement", Materiały Budowlane, 11/2021, pages 28-30. ISSN 0137-2971
17. Justyna Sobczak-Piąstka, Sofiya Burchenya, Yuriy Famulyak, Effect of non-metallic composite reinforcement on load-bearing capacity, IOP Conf. Series: Materials Science and Engineering, 1203 (2021) 032036, IOP Publishing doi:10.1088/1757-899X/1203/3/032036
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glued wood, IOP Conf. Series: Materials Science and Engineering 1203 (2021) 032037, IOP Publishing doi:10.1088/1757-899X/1203/3/032037
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23. Sobczak-Piąstka, J., Marushchak, U., Mazurak, O., Mazurak, A., Nanomodified rapid hardening concretes, IOP Conference Series: Materials Science and Engineering 960(3),032058; 2020; doi:10.1088/1757-899X/960/3/032058
24. Sobczak-Piąstka, J., Babich, Y., Filipchuk, S., Karavan, V., Nalepa, O., Research of deformative properties of concrete taking into account the descending branch of deformation; IOP Conference Series: Materials Science and Engineering; 960(3),032057; 2020; doi:10.1088/1757-899X/960/3/032057
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27. Borysiuk O., Karavan V., Sobczak-Piąstka J., Calculation of the normal section strength,rigidity and crack resistance of beams,strengthened by carbon-fiber materials, SCIENTIFIC SESSION ON APPLIED MECHANICS X: Proceedings of the 10th International Conference on Applied Mechanics, Series: AIP Conference Proceedings 2077, pp. 1-6, USA, New York : AIP Publishing, 2019
28. Babich Y., Filipchuk S., Karavan V., Sobczak-Piąstka J., General requirements for materials of fortification protective structures, SCIENTIFIC SESSION ON APPLIED MECHANICS X: Proceedings of the 10th International Conference on Applied Mechanics, Series: AIP Conference Proceedings 2077, pp. 1-6, USA, New York : AIP Publishing, 2019
29. Gomon S., Gomon S., Karavan V., Gomon P., Sobczak-Piąstka J., Investigation of solid and glued wood on the effect of variables of low-cycle repeated loads, SCIENTIFIC SESSION ON APPLIED MECHANICS X: Proceedings of the 10th International Conference on Applied Mechanics, Series: AIP Conference Proceedings 2077, pp. 1-6, USA, New York : AIP Publishing, 2019
30. Janiak T., Bujarkiewicz A., Sztubecki J., Sobczak-Piąstka J., Gajewski J., Methodology of obtaining and analyzing data on building structures, in: Mosty - Tradycja i Nowoczesność, Wydawnictwa Uczelniane UTP Bydgoszcz, pp. 49-56, 2019
31. Podhorecki A., Sobczak-Piąstka J., editors of the scientific monograph: Bridges - Tradition and Modernity, University Publishing Houses UTP Bydgoszcz, 2019
32. Babich Y., Filipchuk S., Karavan V., Sobczak-Piąstka J., Research of basic mechanical and deformative properties of high-strength fasthardening concretes, SCIENTIFIC SESSION ON APPLIED MECHANICS X: Proceedings of the 10th International Conference on Applied

Mechanics, Series: AIP Conference Proceedings 2077, pp. 1-7, USA, New York : AIP Publishing, 2019

33. Lugchenko O., Nazhem A., Sobczak-Piąstka J., Special type reinforced concrete frame parameters rationalization., SCIENTIFIC SESSION ON APPLIED MECHANICS X: Proceedings of the 10th International Conference on Applied Mechanics, Series: AIP Conference Proceedings 2077, pp. 1-11, USA, New York : AIP Publishing, 2019
34. Andrii, M., Kovalyk I., Mykhailechko V., Sobczak-Piastka J., Strength of joints of concrete abutment surfaces, SCIENTIFIC SESSION ON APPLIED MECHANICS X: Proceedings of the 10th International Conference on Applied Mechanics, Series: AIP Conference Proceedings 2077, pp. 1-7, USA, New York : AIP Publishing, 2019
35. Famulyak Y., Demchyna B., Sobczak-Piąstka J., The influence of size and form of plate anchors on their work at anchoring of reinforcement in the array of cellular concrete, SCIENTIFIC SESSION ON APPLIED MECHANICS X: Proceedings of the 10th International Conference on Applied Mechanics, Series: AIP Conference Proceedings 2077, pp. 1-7, USA, New York : AIP Publishing, 2019
36. Burchenya S., Sobczak-Piąstka J., The research of bearing capacity and stress-strain behavior of bending complex steel concrete beams, SCIENTIFIC SESSION ON APPLIED MECHANICS X: Proceedings of the 10th International Conference on Applied Mechanics, Series: AIP Conference Proceedings 2077, pp. 1-6, USA, New York : AIP Publishing, 2019
37. Hrytsevych A., Famulyak Y., Sobczak-Piąstka J., The influence of temperature on the load-bearing capacity of concrete-steel beams, in: Mosty - Tradycja i Nowoczesność, Wydawnictwa Uczelniane UTP Bydgoszcz, pp. 29-36, 2019
38. Famulyak Y. , Sobczak-Piąstka J., Experimental research of non-autoclaved concrete with unconventional reinforcement, World Multidisciplinary Earth Sciences Symposium – WMESS" in Prague (Czech Republic), IOP Conference Series: Earth and Environmental Science ; 221 ; 1755-1307; 2019
39. Sobczak-Piąstka J., Bujarkiewicz A., Janiak T., Sztubecki J., Gajewski J., Analysis of displacement and deformation of a steel footbridge, World Multidisciplinary Earth Sciences Symposium – WMESS" in Prague (Czech Republic), IOP Conference Series: Earth and Environmental Science ; 221 ; 1755-1307, 2019
40. Famulyak Y., Hrytsevych A., Sobczak-Piąstka J., Influence of freeze-thaw temperature on load-bearing capacity of steel-concrete beams carrying transverse loads, 5th World Multidisciplinary Earth Sciences Symposium : WMESS 2019, IOP Conference Series: Earth and Environmental Science ; 362 ; 1755-1307, 2019, DOI: 10.1088/1755-1315/362/1/012115
41. Zhuravska N., Malkin E., Sobczak-Piąstka J., Energy Efficient Processing of Geothermal Water for Energy-Heating Objects of the Building Industry, 5th World Multidisciplinary Earth Sciences Symposium : WMESS 2019, IOP Conference Series: Earth and Environmental Science ; 362 ; 1755-1307, 2019, DOI: 10.1088/1755-1315/362/1/012116
42. Burchenya S., Famulyak Y., Sobczak-Piąstka J., Modelling of Work of Cut and Stretchy Sheet in Span Beam Structures with the Mixed Reinforcement, 5th World Multidisciplinary Earth Sciences Symposium : WMESS 2019, IOP Conference Series: Earth and Environmental Science ; 362 ; 1755-1307, 2019, DOI: 10.1088/1755-1315/362/1/012114

**List of patents and protective works:**
lack

**List of active participation in conferences:**

1. "On Large-Panel Construction in Poland", VII International Scientific and Technical Conference EFFECTIVE TECHNOLOGIES AND STRUCTURES IN CONSTRUCTION AND RURAL ARCHITECTURE, 6-7 June 2024, Lviv – Dublin, Ukraine, presentation of 1 paper

2. "Energy-efficient building materials", VI International Scientific and Technical Conference EFFECTIVE TECHNOLOGIES AND STRUCTURES IN CONSTRUCTION AND RURAL ARCHITECTURE, 8-9 June 2023, Lviv – Dublin, Ukraine, presentation of 1 paper
3. „ОСНОВНІ ЕТАПИ ПРОВЕДЕННЯ ОБСТЕЖЕНЬ БУДІВЕЛЬ ТА СПОРУД ПОШКОДЖЕНИХ ВНАСЛІДОК НАДЗВИЧАЙНИХ СИТУАЦІЙ, БОЙОВИХ ДІЙ ТА ТЕРОРИСТИЧНИХ АКТІВ", Конференція "Ефективні технології і конструкції в будівництві та архітектура села". Львівський Національний Аграрний Університет, 2022 – presentation of 1 paper.
4. 7th World Multidisciplinary Civil Engineering-Architecture-Urban Planning Symposium WMCAUS 2021, Prague (Czech Republic), 5-9 September 2021 – 3 posters.
5. „ДОСЛІДЖЕННЯ НЕСУЧОЇ ЗДАТНОСТІ ТА ДЕФОРМАТИВНОСТІ У ЗГИНАНИХ КОНСТРУКЦІЯХ, АРМОВАНИХ КОМПОЗИТНОЮ АРМАТУРОЮ", Конференція "Ефективні технології і конструкції в будівництві та архітектура села". Львівський Національний Аграрний Університет, 2021 – presentation of 1 paper.
6. 6th World Multidisciplinary Civil Engineering-Architecture-Urban Planning Symposium WMCAUS 2021, Prague (Czech Republic), 30 August-3 September 2021– 3 posters.
7. Chairing a panel during the II Regional Engineering Forum entitled "Contemporary issues of the investment and construction process, building maintenance and the role of civil engineers in this process", on September 3 and 4, 2021 at the BULWAR Hotel in Toruń.

**List of scholarships and scientific internships:**
lack

**List of participation in scientific grants:**
lack

**Other important academic and professional achievements:**
1. Project manager "Thermal modernization of buildings (3.1 and 3.2) of the University of Technology and Life Sciences along with the replacement of internal lighting POIS.01.03.01-00-0007/16 under sub-measure 1.3.1 priority axis I Reduction of the emission of the economy of the Operational Programme Infrastructure and Environment 2014-2020. Project amount: PLN 12,037,014.58.
2. On the basis of contract No. 7322/IA/SP/2022, on 08/11/2022, the implementation of the project entitled "Integrated measurement and analysis system for structure diagnostics". The amount of funding is PLN 2,117,118.59. These funds were granted on the basis of an application submitted in 2021.
3. Expert of the Foundation for Polish Science in the 2021-2027 financial perspective.
4. Possession of construction qualifications to design and manage construction works in the construction and construction specialty without restrictions.
5. Chairwoman of the District Qualification Committee in the Kujawsko-Pomorskie Voivodeship, which grants building licenses. Examiner of the Regional Qualification Board.

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Rafał Tews

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

Ph.D. in technical sciences in the discipline of civil engineering, 2009.

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

Modern metal structures

**List of functions of supervisor or assistant supervisor of doctoral dissertations:**
lack

**List of reviews in the procedure for scientific promotion:**
lack

**List of scientific publications:**

1. Tews Rafał, Gajewski Jarosław, Influence of Selected Parameters on The Load Capacity of Double-Branch Poles with Battens, TTS Rail Transport Technology, 2014
2. Tews Rafał, Limit states of bearing capacity and use of steel-concrete beams with partial bonding, Building Materials, 2015
3. Gajewski Jarosław, Tews Rafał, Błaszczyński Patryk, Dąbek Andrzej, Fatigue load capacity of steel lightning protection tower according to European standards, Ecology and Technology, 2016
4. Grzybowska Agnieszka, Bajno Dariusz Stanisław, Tews Rafał, Usewicz Bogdan, Emergency condition of a brick vault adjacent to the damaged base of one of the oldest elevators in Europe, Building Materials. Constructs. Technologies. Market, 2017
5. Tews Rafał, Gajewski Jarosław, Elastic and plastic bearing capacity of steel beams with monosymmetric cross-section, Building Materials, 2017
6. Sztubecki Jacek Czesław, Bujarkiewicz Adam, Tews Rafał, Brunka Paulina, Studies of deformations of a telecommunications tower subjected to the influence of insolation, JOURNAL OF CIVIL ENGINEERING, ENVIRONMENT AND ARCHITECTURE, 2017
7. Bajno Dariusz Stanisław, Grzybowska Agnieszka, Tews Rafał, Revitalization of historical truss structures on the example of a reinforced concrete flyover from 1911, Building Materials, 2018
8. Bujarkiewicz Adam, Gajewski Jarosław, Janiak Tomasz Andrzej, Sobczak-Piąstka Justyna, Sztubecki Jacek Czesław, Tews Rafał, Analysis of vertical displacements of the Esperanto footbridge in Bydgoszcz, Civil and Environmental Engineering Reports, 2018
9. Tews Rafał, Grzybowska Agnieszka, Bajno Dariusz, Operational Safety of Skeleton Frame Built Structures with a Low-Rigidity Covering, 3rd World Multidisciplinary Civil Engineering, Architecture, Urban Planning Symposium (WMCAUS 2018), 2019

10. Bajno Dariusz Stanisław, Tews Rafał, Grzybowska Agnieszka, Erroneous executive decisions as the cause of steel chimney failure, Inżynieria i Budownictwo, 2019

**List of patents and protective works:**
lack

**List of active participation in conferences:**
lack

**List of scholarships and scientific internships:**
lack

**List of participation in scientific grants:**
lack

**Other important academic and professional achievements:**

1. Medal of the National Education Commission – 2022

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# CRITERION 3

# Qualifications of academic teachers or research staff conducting education at the doctoral school

## agriculture and horticulture

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Anna Wenda - Piesik

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

Academic title - Professor / field of study - agricultural sciences / discipline agriculture and horticulture / year of obtaining - 2019

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

1. Methodology and planning of the study
2. Research Methodology and Planning
3. Data analysis - statistics, data visualization
4. Data Analysis - Statistics, Data Visualization
5. Contemporary trends in the development of science
6. Contemporary Trends in Scientific Development

The following lists refer to the last 5 years, with particular emphasis on achievements related to classes conducted at the Doctoral School of the Bydgoszcz University of Technology.

**List of doctoral dissertation supervisor functions:**
<u>After the defenses</u>

1. Maciej Kazek, Ph.D. Eng. – Title of the dissertation "Effect of cultivar, inoculation and hydrogel on the yield and quality of conventional soybean seeds (*Glycine max* (L.) Merr" Resolution No. 23/2020/2021 of 26.03.2021
2. Agnieszka Nowak, Ph.D. – Title of the dissertation "Effects of various applications of iron nanoparticles on
   rapeseed plants (*Brassica napus* var. *oleifera*) in the early growth and development stages", Resolution No. 10/2023/2024 of 27.10.2023

<u>Open doctoral proceedings</u>

3. Mateusz Nowakowski, M.Sc., Eng. - Title of the dissertation "Research on the biology and competitiveness of herbicide-resistant weed biotypes".

<u>Implementation doctorate in continuation</u>

4. Krystian Ambroziak, M.Sc. – Project title / working title of doctoral dissertation: Implementations in the cultivation and use of hemp seeds and soybeans nGM in the ZUBR plant for food purposes. Registration number: DWD/5/0047/2021

<u>Applications for an implementation doctorate in preparation</u>

5. 3 applications in the field of agricultural sciences for the Implementation Doctorate 2024 competition

**List of reviews in the procedure for scientific promotion:**

1. Review of Jacek Sosnowski's application for the academic title of professor in agricultural sciences in the discipline of agriculture and horticulture – 2023
2. Review of Przemysław Barłóg's application for the title of professor in agricultural sciences in the discipline of agriculture and horticulture – 2023
3. Review of Jolanta Kowalska's application for the award of the academic title of professor in the field of agricultural sciences in the discipline of agriculture and horticulture – 2022
4. Review of Agnieszka Rutkowska's application for the award of the degree of habilitated doctor in the field of agricultural sciences in the discipline of agriculture and horticulture – 2022
5. Review of Agnieszka Łącka's application for the award of the degree of habilitated doctor in the field of agricultural sciences in the discipline of agriculture and horticulture – 2022
6. Review of Mariola Parzonek's PhD in Agricultural Sciences in the discipline of Agriculture and Horticulture - 2021

**List of scientific publications:**

1. Year: 2024; Authors: Tymoszuk Alicja, Wenda-Piesik Anna, Szałaj Urszula, Wojnarowicz Jacek; Title: Analysis of architecture of chrysanthemum plantlets in response to zinc oxide, silver and auxin treatment in shoot-tip culture; Journal: Acta Societatis Botanicorum Poloniae; Impact Factor: 1,000; Total score of the Ministry of Science and Higher Education: 70,000
2. Year: 2023; Authors: Ambroziak Krystian, Wenda-Piesik Anna, Kozera Wojciech; Title: Regulating the plant density influences weed infestation, productivity and chemical composition of seeds of true hemp Cannabis sativa L.; Journal: Journal of Elementology; Impact Factor: 0.800; Total score of the Ministry of Science and Higher Education: 140,000
3. Year: 2023; Authors: Wacławowicz Roman, Giemza Magdalena, Pytlarz Elżbieta, Wenda-Piesik Anna.; Title: The Impact of Cultivation Systems on Weed Suppression and the Canopy Architecture of Spring Barley; Journal: Agriculture; Impact Factor: 3.600; Total score of the Ministry of Science and Higher Education: 140,000
4. Year: 2023; Authors: Szulc Joanna, Błaszak Błażej, Wenda-Piesik Anna, Gozdecka Grażyna, Żary-Sikorska Ewa, Bąk Małgorzata, Bauza-Kaszewska Justyna.; Title: Zero Waste Technology of Soybeans Processing; Journal: Sustainability; Impact Factor: 3.900; Total score of the Ministry of Science and Higher Education: 100,000
5. Year: 2022; Authors: Ligor Tomasz, Adamczyk Przemysław, Kowalkowski Tomasz, Ratiu Ileana Andreea, Wenda-Piesik Anna, Buszewski Bogusław.; Title: Analysis of VOCs in Urine Samples Directed towards of Bladder Cancer Detection; Journal: Molecules; Impact Factor: 4,600; Total score of the Ministry of Science and Higher Education: 140,000
6. Year: 2022; Authors: Wenda-Piesik Anna, Synowiec Agnieszka, Marcinkowska Katarzyna, Wrzesińska Barbara, Podsiadło Cezary, Domaradzki Krzysztof, Kuc Piotr, Kwiecińska-Poppe Ewa.; Title: Intra- and interspecies competition of blackgrass and wheat in the context of herbicidal resistance and environmental conditions in Poland; Journal: Scientific Reports; Impact Factor: 4,600; Total score of the Ministry of Science and Higher Education: 140,000
7. Year: 2022; Title: Productive and Ecological Aspects of Mixed Cropping System / Ed. Anna Wenda-Piesik, Agnieszka Synowiec; Published: MDPI, 2022; Physical description: 157 pp. : Bibliogr., fig., summ.; Character. substantive according to PBN: Scientific monograph; Language of publication: ENG; Total score of the Ministry of Science and Higher Education: 5,000
8. Year: 2022; Authors: Wenda-Piesik Anna, Ambroziak Krystian.; Title: The Choice of Soybean Cultivar Alters the Underyielding of Protein and Oil under Drought Conditions in Central

Poland; Journal: Applied Sciences; Impact Factor: 2,700; Total score of the Ministry of Science and Higher Education: 100,000

9. Year: 2021; Authors: Wenda-Piesik Anna, Piesik Dariusz.; Title: Diversity of Species and the Occurrence and Development of a Specialized Pest Population - A Review Article; Journal: Agriculture; Impact Factor: 3.408; Total score of the Ministry of Science and Higher Education: 100,000
10. Year: 2021; Authors: Synowiec Agnieszka, Jop Beata, Domaradzki Krzysztof, Podsiadło Cezary, Gawęda Dorota, Wacławowicz Roman, Wenda-Piesik Anna, Nowakowski Mateusz M., Bocianowski Jan, Marcinkowska Katarzyna, Praczyk Tadeusz.; Title: Environmental Factors Effects on Winter Wheat Competition with Herbicide-Resistant or Susceptible Silky Bentgrass (Apera spica-venti L.) in Poland; Journal: Agronomy; Impact Factor: 3.949; Total score of the Ministry of Science and Higher Education: 100,000
11. Year: 2021; Authors: Stankiewicz-Kosyl Marta, Haliniarz Małgorzata, Wrochna Mariola, Synowiec Agnieszka, Wenda-Piesik Anna, Tendziagolska Ewa, Sobolewska Magdalena, Domaradzki Krzysztof, Skrzypczak Grzegorz, Łykowski Witold, Krysiak Michał, Bednarczyk Marcin, Marcinkowska Katarzyna, Marcinkowska Katarzyna.; Title: Herbicide Resistance of Centaurea cyanus L. in Poland in the Context of Its Management; Journal: Agronomy; Impact Factor: 3.949; Total score of the Ministry of Science and Higher Education: 100,000
12. Year: 2021; Authors: Lema-Rumińska Justyna, Kulus Dariusz, Tymoszuk Alicja, Miler Natalia, Woźny Anita, Wenda-Piesik Anna.; Title: Physiological, Biochemical, and Biometrical Response of Cultivated Strawberry and Wild Strawberry in Greenhouse Gutter Cultivation in the Autumn-Winter Season in Poland—Preliminary Study; Journal: Agronomy; Impact Factor: 3.949; Total score of the Ministry of Science and Higher Education: 100,000
13. Year: 2021; Authors: Wenda-Piesik Anna, Synowiec Agnieszka.; Title: Productive and Ecological Aspects of Mixed Cropping System; Journal: Agriculture; Impact Factor: 3.408; Total score of the Ministry of Science and Higher Education: 100,000
14. Year: 2021; Authors: Ligor Tomasz, Zawadzka Joanna, Straczyński Grzegorz, González Paredes Rosa M., Wenda-Piesik Anna, Ratiu Ileana Andreea, Muszytowski Marek.; Title: Searching for Potential Markers of Glomerulopathy in Urine by HS-SPME-GC×GC TOFMS; Journal: Molecules; Impact Factor: 4.927; Total score of the Ministry of Science and Higher Education: 140,000
15. Year: 2020; Authors: Sobolewska Magdalena, Wenda-Piesik Anna, Jaroszewska Anna, Stankowski Sławomir.; Title: Effect of Habitat and Foliar Fertilization with K, Zn and Mn on Winter Wheat Grain and Baking Qualities; Journal: Agronomy; Impact Factor: 3.417; Total score of the Ministry of Science and Higher Education: 100,000
16. Year: 2020; Authors: Stankiewicz-Kosyl Marta, Synowiec Agnieszka, Haliniarz Małgorzata, Wenda-Piesik Anna, Domaradzki Krzysztof, Parylak Danuta, Wrochna Mariola, Pytlarz Elżbieta, Gala-Czekaj Dorota, Marczewska-Kolasa Katarzyna, Marcinkowska Katarzyna, Praczyk Tadeusz.; Title: Herbicide Resistance and Management Options of Papaver rhoeas L. and Centaurea cyanus L. in Europe: A Review; Journal: Agronomy; Impact Factor: 3.417; Total score of the Ministry of Science and Higher Education: 100,000
17. Year: 2020; Authors: Gałęzewski Lech, Jaskulska Iwona, Wilczewski Edward, Wenda-Piesik Anna.; Title: Response of yellow lupine to the proximity of other plants and unplanted path in strip intercropping.; Journal: Agriculture; Impact Factor: 2.925; Total score of the Ministry of Science and Higher Education: 100,000
18. Year: 2020; Authors: Piekarczyk Mariusz, Wenda-Piesik Anna, Gałęzewski Lech, Kotwica Karol.; Title: WEED CONTROL IN LEGUMES WITH REDUCED DOSES OF LINURON AND CLOMAZONE; Parallel title: WEED CONTROL IN LEGUMES WITH REDUCED DOSES OF LINURON AND

CLOMAZONE; Journal: Acta Scientiarum Polonorum Agricultura; Total score of the Ministry of Science and Higher Education: 20,000

**List of patents and protective works:**

1. Year: 2024.; Authors: **Wenda-Piesik Anna**, Wolna Dominika, Retmański Bartosz.; Patent Title: Plant Cultivation & Care Pot; Document type: Utility model protection description; Country code: PL; Patent/protection right number: Ru. 73341; Invention application number: 130639; Date of filing the invention: 2022.03.07; Granting of protection: 2024.02.12 WUP 07/2024; Patent holder: BYDGOSZCZ UNIVERSITY OF TECHNOLOGY, Bydgoszcz; Character. formal: Polish patent

**List of active participation in conferences:**

1. Year: 2022.; Authors: Żary-Sikorska Ewa, Błaszak Błażej, Bauza-Kaszewska Justyna, Szulc Joanna, Gozdecka Grażyna, Wenda-Piesik Anna.; Title: The organic nGMO soybeans as a raw material in soy milk innovation production; Title: In: 2nd World Congress on Food Safety and Nutrition Science; Conference/convention - place and date: London : 22-23.08.2022; Conference/convention - title: Conference Series llc LTD
2. Year: 2023.; Authors: Szulc Joanna, Błaszak Błażej, Wenda-Piesik Anna, Gozdecka Grażyna, Żary-Sikorska Ewa, Bąk Małgorzata, Bauza-Kaszewska Justyna.; Title: Zero waste technology of soybeans processing; Title: In: 2nd Zero Waste Technologies Seminar; Conference/convention - place and date: Bydgoszcz : 31.05.2023; Conference/convention - title: Bydgoszcz University of Technology; Published: Bydgoszcz : UNIVERSITY PUBLISHING HOUSES of the Bydgoszcz University of Technology, 2023; p-ISBN: 978-83-66530-88-1; Physical description: p. 10

**List of scholarships and scientific internships:**

lack

**List of participation in scientific grants:**

1. 2017 – 2021, NCBiR BIOSTRATEG, Strategy for counteracting weed resistance to herbicides as an important factor in ensuring the sustainable development of the agroecosystem, BioHerOd, 3/347445/1/NCBR/2017, manager
2. 2018 – 2020, ARiMR, Soybeans in the Kujawsko-Pomorskie and Wielkopolskie Voivodeships - innovative solutions in cultivation and feeding for farms , Moja Soja, 00003.DDD.6509.00029.2017.02, manager
3. 2023 – 2024, ARiMR, Innovative solutions in low-carbon crop production combined with improved field descaling technology - an innovative practice to reduce the carbon footprint in the cultivation of rye, sugar beet and alfalfa using a field descaling machine, improving soil structure, efficiency of cultivation technologies and organizational on the farm, SOSS Stone Off Save Soil, 00135.DDD.6509.00117.2022.02, manager
4. 2021 – 2025, Mein Implementation in the cultivation and use of hemp seeds and GM soybeans in the ZUBR plant for food purposes DWD/5/0047/2021, manager

**Other important academic and professional achievements:**

Granting and use of a targeted subsidy for the AgroPV project for the amount of PLN 2,136,679;
Programme name: Investment in science
Project (investment) title: AgroPV
Type of project (investment): Apparatus

Organizational unit of the applicant implementing the project: Faculty of Agriculture and Biotechnology
Project (investment) location: Agricultural Experimental Plant in Minikowo
Project (investment) start date: 2022-11-08
Project (investment) completion date: 2024-12-31
Date of the beneficiary's last payment: 2024-04-03
Field and discipline of science covered by: 4.2 - Field of agricultural sciences/agriculture and horticulture

POLITECHNIKA BYDGOSKA
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HR EXCELLENCE IN RESEARCH

# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Bożena Dębska

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

M.Sc. in Chemistry – 1990
PhD in agricultural sciences, agronomy – 1996
Doctor of agricultural sciences, agronomy – 2004
Professor of Agricultural Sciences – 2010

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

1. Biogeochemistry – course coordinator

**List of functions of supervisor or assistant supervisor of doctoral dissertations:**

1. Magdalena Banach-Szott, PhD; Differentiation of the properties of humic substances of ecto- and endohumus of soils under different tree species. Public Defence – 2006 PROMOTOR
2. Małgorzata Drąg, PhD, Eng.; The role of post-harvest residues in shaping the properties of humic acids of soils of various types.; Public Defense - 2009. PROMOTER
3. Ewa Rosa, PhD, Eng.; Seasonal changes in the content of soluble organic matter in soils used for agriculture; Public Defense - 2016. PROMOTER
4. Anna Ziółkowska, Ph.D., Eng.; Transformations of phenolic compounds in meadow soils.; Public Defense - 2019. PROMOTER

**List of reviews in the procedure for scientific promotion:**

1. Reviewer in doctoral dissertations – 3;
2. Reviewer in the proceedings for awarding the degree of habilitated doctor – 6
3. Reviewer in the proceedings for the award of the title of professor – 2, including one at the request of the University of Agriculture in Nitra.

**List of scientific publications:**

Years 2019-2024:

1. Banach-Szott M., Dębska B., Tobiasova E., Pakuła J. 2019. Structural Investigation of Humic Acids of Forest Soils by Pyrolysis-Gas Chromatography. Pol. J. Environ. Stud. Vol. 28, No. 6, 4099-4107. DOI: 10.15244/pjoes/97392.
2. Rosa E., Dębska B., Pakuła J., Tobiasova E., 2019. Content And Changes In Dissolved Organic Matter in Meadow And Arable Soils Over Time. Polish Journal of Soil Science, 183-194. LII/2. DOI: 10.17951/pjss/2019.52.2.183.
3. Banach-Szott M., Jaskulska I., Dębska B., Jaskulski D. 2020. Effect of the Tillage System on the Properties of Humic Acids of Soil of the Kujawy Region in Poland. Journal of Agricultural Science; Vol. 12, No. 8; 14-24, doi:10.5539/jas.v12n8p14.
4. Dębska B., Jaskulska I., Jaskulski D. 2020. Method of Tillage with the Factor Determining the Quality of Organic Matter. Agronomy,10,1250; DOI:10.3390/agronomy10091250.

5. Jaskulska I., Romaneckas K., Jaskulski D., Gałęzewski L., Breza-Boruta B., Dębska B., and Lemanowicz J. 2020. Soil Properties after Eight Years of the Use of Strip-Till One-Pass Technology. Agronomy 10(10), 1596; https://doi.org/10.3390/agronomy10101596.
6. Ziółkowska A., Dębska B., Banach-Szott M. 2020. Transformations of phenolic compounds in meadow soils. Scientific Reports. (2020)10:19330; 1-14:https://doi.org/10.1038/s41598-020-76316-7.
7. Ziółkowska A., Dębska B., Banach-Szott M. 2020. Content of Phenolic Compounds in Meadow Vegetation and Soil Depending on the isolation method. Molecules 2020, 25, 5462; DOI:10.3390/molecules25225462.
8. Kobierski M., Jaskulska I., Jaskulski D., Dębska B. 2020. Effect of a tillage system on the chemical properties of sandy loam soils. Journal of Elementology. 2020, 25, 4, pp. 1463-1473.
9. Dębska B.; Spychaj-Fabisiak E.,; Szulc W.; Gaj R.; Banach-Szott M. 2021. EPR Spectroscopy as a Tool to Characterize the Maturity Degree of Humic Acids. Materials, Volume 14, Issue 12, 3410.
10. Banach-Szott M., Dębska B., Tobiasova E. 2021. Properties of humic acids depending on the land use in different parts of Slovakia. Environmental Science and Pollution Research 28:58068–58080 https://doi.org/10.1007/s11356-021-14616-9.
11. Wojewódzki P., Lemanowicz J., Dębska B., Haddad S.A. 2022. Soil Enzyme Activity Response under the Amendment of Different Types of Biochar. Agronomy, 12(3), 569; https://doi.org/10.3390/agronomy12030569.
12. Dębska B., Kotwica K., Banach-Szott M., Spychaj-Fabisiak E. and Tobiašová E. 2022. Soil Fertility Improvement and Carbon Sequestration through Exogenous Organic Matter and Biostimulant Application. Agriculture, 12, 1478. https://doi.org/10.3390/agriculture12091478.
13. Wojewódzki P., Lemanowicz J., Dębska B., Haddad S.A., Tobiasova E. 2023. The Application of Biochar from Waste Biomass to Improve Soil Fertility and Soil Enzyme Activity and Increase Carbon Sequestration. Energies 2023, 16(1), 380, 1-16. https://doi.org/10.3390/en16010380
14. Lemanowicz J., Dębska B., Lamparski R., Michalska A., Poberężny J., Wszelaczyńska E., Bartkowiak A., Szczepanek M., Banach-Szott M., Knapowski T. 2023. Influence of Plant Growth Retardants and Nitrogen Doses on the Content of Plant Secondary Metabolites in Wheat, the Presence of Pests, and Soil Quality Parameters. Agriculture 13, 1121. https://doi.org/10.3390/agriculture13061121.
15. Tobiasova E., Lemanowicz J., Debska B., Kunkelova M., Sakac J. 2023. The Effect of Reduced and Conventional Tillage Systems on Soil Aggregates and Organic Carbon Parameters of Different Soil Types. Agriculture 2023, 13, 818 DOI10.3390/agriculture13040818.
16. Tobiasova E., Lemanowicz J., Debska B., Kunkelova M., Sakac J. 2023. Suitability of Various Parameters for the Determination of the Condition of Soil Structure with Dependence to the Quantity and Quality of Soil Organic Matter. Sustainability 2023, 15, 11047. https://doi.org/10.3390/su151411047.
17. Jaskulska I., Lemanowicz J., Dębska B, Jaskulski D., Breza-Boruta B. 2023. Changes in Soil Organic Matter and Biological Parameters as a Result of Long-Term Strip-Till Cultivation. Agriculture 2023, 13, 2188, 1-19. https://doi.org/10.3390/agriculture13122188.
18. Lemanowicz J., Bartkowiak A., Dębska B., Majcherczak E., Michalska A. 2024. Mineral Components, Organic Matter Quality and Soil Enzymatic Activity under the Influence of Differentiated Farmyard Manure and Nitrogen Fertilisation. Minerals 2024, 14, 645. https://doi.org/10.3390/min14070645.
19. Dębska B., Długosz J., Piotrowska-Długosz A. The content and quality of soil carbon and nitrogen as well as enzymatic activity in soils with diverse texture following different land use and management practices. Soil Use Manage. 2024; 40:E13106, 1-18. https://doi.org/10.1111/sum.13106.

20. Wojewódzki P., Kondratowicz-Maciejewska K., Dębska B., Jaskulska I., Jaskulski D., Pakuła J. 2024 Luvisol soil macroaggregates under the influence of conventional, strip-till, and reduced tillage practice. International Agrophysics, 38, 3, 311-324. https://doi.org/10.31545/intagr/188617.

**List of patents and protective works:**
lack

**List of active participation in conferences:**
Years 2019-2024:

1. "Contemporary research directions in the field of soil geography, palaeaeopedology and organic matter in the environment", Toruń, 3-4 March 2019.

**List of scholarships and scientific internships:**
lack

**List of participation in scientific grants:**
Years 2019-2024

1. NCN research project, Opus 15 "Factors determining changes in enzymatic activity and functional and genetic diversity of microorganisms in the soil profile in relation to diverse soil types and methods of their agricultural use"; application registration no. 2018/29/B/NZ9/00982, contractor

**Other important academic and professional achievements:**

1. Member of scientific committees of national and international conferences. Reviewer of publications of journals with IF; reviewer of the textbook and monograph.
2. Member of the Polish Society of Soil Science (since 1990); Polish Society of Humic Substances (since 2011 vice-president) and International Humic Substances Society (since 1992)

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HR EXCELLENCE IN RESEARCH

# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Dariusz Piesik

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

Professor, discipline: agriculture and horticulture, year of obtaining the title: 2018.

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

1. PhD Seminar

The following lists refer to the last 5 years, with particular emphasis on achievements related to classes conducted at the Doctoral School of the Bydgoszcz University of Technology.

**List of doctoral dissertation supervisor functions:**

1) Piotr Tabaka – scholarship holder of the third edition 2010/2011 Step into the future – scholarships for doctoral students. The title of the dissertation: "The influence of volatile organic compounds secreted by the vegetative and generative parts of rapeseed on the behavior of adult rapeseed sweetweed". WRiB UTP in Bydgoszcz, award of the degree on 16.09.2013.
2) Agata Skoczek - scholarship holder of the fourth edition 2012/2013 Step into the future – scholarships for doctoral students. The title of the dissertation: "Volatile organic compounds secreted in the defensive reaction of maize to stress and communication between damaged and healthy plants". WRiB UTP in Bydgoszcz, award of the degree on 28.03.2014.
3) Sebastian Sendel - Title of the dissertation: "The effect of volatile organic compounds secreted by wheat under the influence of insect feeding and synthetic dihydrojasmon on the behavior of adult specimens of the cereal lednica (*Aelia acuminata* L.)". WRiB UTP in Bydgoszcz, awarding the degree on 22.09.2015.
4) Ireneusz Kalka - Title of the dissertation: "The effect of the application of biostimulants on the emission of volatile organic compounds by selected varieties of winter rapeseed" WRiB UTP in Bydgoszcz, awarded the degree on 19.05.2019.
5) Anita Krasińska - Title of the dissertation: "The effect of elicitors (methyl jasmonate and Z-jasmonium) on the induction of the maize defense reaction", WRiB, PBS, 2023.

**List of reviews in the procedure for scientific promotion:**

1) 2023 – review of the doctoral dissertation, Marcin Cierpisz, MSc, Eng., Wrocław University of Environmental and Life Sciences, Faculty of Natural Sciences and Technology, Department of Plant Protection.
2) 2019 – review in the procedure for professorship, Cezary Tkaczuk, PhD, DSc, Eng., University of Natural Sciences and Humanities in Siedlce, Department of Plant Protection and Breeding.
3) 2019 – review in the habilitation procedure, Joanna Zamojska, PhD, Institute of Plant Protection – National Research Institute.

4) 2018 – review of the doctoral dissertation, Barbara Biniaś, MSc, University of Agriculture in Krakow, Faculty of Agriculture and Economics, Department of Agricultural Environmental Protection.
5) 2017 – review in habilitation proceedings, Agnieszka Wójcicka, PhD, University of Natural Sciences and Humanities in Siedlce, Faculty of Natural Sciences, Department of Biochemistry and Molecular Biology.
6) 2016 – review of the doctoral dissertation, Sandra Milena Aragón, Georg August University, Department of Crop Sciences, Agricultural Entomology.
7) 2016, review of the doctoral dissertation, Felipe Borrero, Swedish University of Agricultural Sciences, Department of Plant Protection Biology, Division of Chemical Ecology, review made in 2016.
8) 2012 – review of the doctoral dissertation, Małgorzata Janiuk, MA, University of Life Sciences in Lublin, Faculty of Horticulture and Landscape Architecture.

**List of scientific publications (last 5 years and 2024):**

1) Piesik Dariusz, Miler Natalia, Lemańczyk Grzegorz, Tymoszuk Alicja, Lisiecki Karol, Bocianowski Jan, Krawczyk Krzysztof, Mayhew Chris A.Induction of volatile organic comp ounds in chrysanthemum plants following infection by *Rhizoctonia solani*. PLoS One 2024, 19(5), e0302541, 1-23.
2) Bruzzoniti Maria Concetta, Del Bubba Massimo, Giordani Edgardo, Fibbi Donatella, Beldean-Galea Mihail Simion, Piesik Dariusz, Rivoira Luca. Organic micropollutants in the agricultural chain of production of strawberries by irrigation with treated wastewater and assessment of human health implications. Water 2024, 16(6), 830, 1-13.
3) Lemańczyk Grzegorz, Lisiecki Karol, Piesik Dariusz. Binucleate Rhizoctonia Strain: A Potential Biocontrol Agent in Wheat Production. Agronomy 2023, 13(2), 523.
4) Piesik Dariusz, Łyczko Jacek, Krawczyk Krzysztof, Gantner Magdalena, Bocianowski Jan, Ruzsanyi Veronika, Mayhew Chris A.Green leaf volatile function in both the natural defense system of *Rumex confertus* and associated insects' behavior. Applied Sciences 2023, 13(4), 2253, 1-13.
5) Gantner Magdalena, Dariusz the dog. Edible, nutritious and sustainable - insects as an alternative source of protein. Title of the whole thing: In: Institutional partnership in shaping eating behaviour for public health/ed. Krystyna Gutkowska, Warsaw : SGGW Publishing House, 2023.
6) Logesh Rajan, Das Niranjan, Sellappan Gobi, Doesik Darius, Mondal Arijit. Unripe fruits of *Litchi chinensis* (Gaertn.) Sonn.: An overview of its toxicity. Fruits non murs de *Litchi chinensis* (Gaertn.) Sonn.: un aperçu de sa toxicité. Annales Pharmaceutiques Françaises 2023, 81, 6, 925-934.
7) Piesik Dariusz, Lemańczyk Grzegorz, Bocianowski Jan, Buszewski Bogusław, Vidal Stefan, Mayhew Chtis A.Induction of volatile organic compounds in *Triticum aestivum* (wheat) plants following infection by different *Rhizoctonia* pathogens is species specific. Phytochemistry 2022, 113, 62, 1-9.
8) Piesik Dariusz, Aksoy Julia, Łyczko Jacek, Bocianowski Jan, Buszewski Bogusław, Piesik Magdalena, Mayhew Chris A.Relationships between volatile organic compounds released by wheat plants following artificial stress and their potential influence on natural pest management. Applied Sciences 2022, 12, 7762, 1-14.

9) Piesik Dariusz, Bocianowski Jan, Kotwica Karol, Lemańczyk Grzegorz, Piesik Magdalena, Ruzsanyi Veronika, Mayhew Chris A.Responses of Adult *Hypera rumicis* L. to synthetic plant volatile blends. Molecules 2022, 27, 6290, 1-13.
10) Lisiecki Karol, Lemańczyk Grzegorz, Piesik Dariusz, Mayhew Chris A.Screening winter wheat genotypes for resistance traits against *Rhizoctonia cerealis* and *Rhizoctonia solani* infection. Agriculture 2022, 12(12), 1981, 1-12.
11) Sendel Sebastian, Bocianowski Jan, Buszewski Bogusław, Magdalena the dog, Mayhew Chris A., Dariusz the dog. Volatile organic compounds released by wheat as a result of striped shieldbug feeding and insect behaviour. Journal of Applied Entomology 2022, 146, 710-724.
12) Wenda-Piesik Anna, Piesik Dariusz. Diversity of species and the occurrence and development of a specialized pest population - A review article. Agriculture 2021, 11, 16, pp. 1-14.
13) Łyczko Jacek, Twardowski Jacek Piotr, Skalny Bartłomiej, Galek Renata, Szumny Antoni, Gruss Iwona, Piesik Dariusz, Sendel Sebastian. *Sarracenia alata* (Alph.Wood) Alph.Wood microcuttings as a source of volatiles potentially responsible for insects' respond. Molecules 2021, 26, 2406, pp. 1-13.
14) Piesik Dariusz, Bocianowski Jan, Sendel Sebastian, Krawczyk Krzysztof, Kotwica Karol. Beetle orientation responses of *Gastrophysa viridula* and *Gastrophysa polygoni (*Coleoptera: Chrysomelidae) to a blend of synthetic volatile organic compounds. Environmental Entomology 2020, 49(5), 1071-107.
15) Piesik Dariusz, Gęsiński Krzysztof, Lemańczyk Grzegorz, Bocianowski Jan, Buszewski Bogusław, Krawczyk Krzysztof. Effect of *Lugus* sp. feeding and a saponin application on volatiles released by quinoa. Pakistan Journal of Botany 2020, 52, 6.
16) Gantner Magdalena, Najda Agnieszka, Piesik Dariusz. Effect of phenolic acid content on acceptance of hazel cultivars by filbert aphid. Plant Protection Science 2019, 55, 2, 116-122.
17) Bocianowski Jan, Nowosad Kamila, Szulc Piotr, Tratwal Anna, Bakinowska Ewa, Piesik Dariusz. Genetic parameters and selection of maize cultivars using Bayesian inference in a multi-trait linear model. Acta Agriculturae Scandinavica, Section B - Soil & Plant Science 2019, 69, 6, 465-478.

**List of patents and protective works:**

1. Registration certificate issued by the Patent Office of the Republic of Poland: 10.02.2004. - Registration law No. 2202 of the industrial design entitled Trap for winged insects. Authors: Wojciech Śliwa, Dariusz Piesik, Piotr Tabaka.
2. Protection right granted by the Patent Office of the Republic of Poland: 2) 12.07.2004. – Protection Law No. 61176 of the utility model entitled Trap for winged insects. Authors: Wojciech Śliwa, Dariusz Piesik, Piotr Tabaka.

**List of active participation in conferences (last 5 years):**

1) "Herbs, Herbalism, Herbal Medicine and Natural Products", Anna Vasa Kuyavian-Pomeranian Herbal Centre, 12-14.05.2024., Golub Dobrzyń - "Emission of volatile organic compounds secreted by plants in response to stress and insect response to mixtures of compounds".
2) "Herbs, Herbalism, Herbal Medicine and Natural Products", Anna Wazówna Kuyavian-Pomeranian Herbal Centre, 14-16.05.2023., Golub Dobrzyń - "The impact of stress on the emission of volatile organic compounds by plants and on the behaviour of insects".
3) "15th Edition of International Conference on Catalysis, Chemical Engineering and Technology (Hybrid Event)" during May 22-23, 2023 in Tokyo, Japan - "Induction of volatile organic compounds in wheat plants following infection by different *Rhizoctonia* pathogens".

4) "3rd Global Congress on Plant Biology and Biotechnology (GPB-2019)" to be held during March 11-13, 2019 in Singapore - "Volatile organic compounds released by maize following herbivory or insect extract application and communication between plants".

**List of scholarships and scientific internships:**

1) 05/1999 – 06/1999, National Environmental Research Institute, Department of Terrestrial Ecology, Silkeborg, Denmark.
2) 03/2002 – 07/2003 - Montana State University, Department of Entomology, currently Department of Land Resources and Environmental Sciences, USA.
3) 09/2005 – 08/2007 - Institut National de la Recherche Agronomique, Versailles-Grignon, France.

**List of participation in scientific grants:**

1. European Union Framework Programme (Marie Curie Intra-European Fellowships (EIF), project no. MEIF-CT-2005-514931), 2005 - 2007.
2. European Union Framework Programme (Marie Curie European Reintegration Grants, ERG, project no. MERG-CT-2007-200265), 2007 – 2010.
3. Grant awarded by the Ministry of Science and Higher Education, Contract No: 1648/B/P01/2010/39, 2010 – 2013.

**Other important academic and professional achievements:**

1. Since 2020, he has been a member of the Analytical Team for Food, Raw Materials and Food Products, Committee on Analytical Chemistry of the Polish Academy of Sciences.

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# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Tomasz Knapowski

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

Dr Hab. Eng. / Agricultural Sciences / Agriculture and Horticulture / Prof. PBŚ / 2019

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

1. Modern methods of soil-plant research

**List of functions of supervisor or assistant supervisor of doctoral dissertations:**

1. Supervisor of the doctoral dissertation of Małgorzata Moskal, M.Sc., Title: "*Assessment of the content of elements in the soil-plant system in a long-term fertilizer experiment",* Deadline for defense: 05.11.2024

Assistant supervisor of two doctoral dissertations:

1. Katarzyna Mitura, M.Sc. – *The effect of biostimulant preparations on the size and quality of grain yield of the studied maize cultivars* (*Zea mays* L.) *grown in monoculture*
2. Justyna Jachymska, M.Sc., Eng. – *Yielding and technological value of grain of spring forms of Triticum spelta L. and Triticum aestivum L. cultivated after different forecrops*

**List of reviews in the procedure for scientific promotion:**

1. 08.2020 - review of the doctoral dissertation of Tomasz Niedziński, M.Sc., Eng. (Independent Department of Agricultural Chemistry, Institute of Agriculture, Warsaw University of Life Sciences), on "*The impact of the deep mineral fertilization system on the yield and quality of potatoes*", supervisor: Prof. Jan Łabętowicz, assistant supervisor: Tomasz Sosulski, PhD, DSc,
2. 08.2022 – review of the doctoral dissertation of Dominik Ptasiński, M.Sc., Eng. (Faculty of Agriculture and Biology, Warsaw University of Life Sciences), on "*Possibilities of using composts from waste organic matter of agricultural origin in the management of marginal land*", supervisor: Prof. Wiesław Szulc, assistant supervisor: Tomasz Horaczek, PhD, Eng.

**List of scientific publications:**

1. KNAPOWSKI T., BARCZAK B., KOZERA W., POBEREŻNY J., WSZELACZYŃSKA E. 2019. Crop stimulants as a factor determining the yield and quality of winter wheat grown in Notec Valley, Poland. Current Science, 116(6), 1009-1015. DOI: 10.18520/cs/v116/i6/ 1009-1015.
2. KOZERA W., SPYCHAJ-FABISIAK E., MAJCHERCZAK E., BARCZAK B., KNAPOWSKI Vol. 2019. Responce of coriander to fertilization with nitrogen and boron. Journal of Elementology, 24(3), 897-909. DOI:10.5601/jelem.2018.23.4.1773
3. KNAPOWSKI T. 2019. Reaction of wheat spelt of Rokosz cultivar to mineral fertilization. University Publishing House of the University of Technology and Life Sciences in Bydgoszcz, p.171. ISBN 978-83-65603-68-5

4. WSZELACZYŃSKA E., POBEREŻNY J., KOZERA W., KNAPOWSKI T., PAWELZIK E., SPYCHAJ-FABISIAK E. 2020. Effect of magnesium supply and storage time on anti-nutritive compounds in potato tubers. Agronomy 10, 339; 1-16. DOI:10.3390/agronomy10030339
5. WSZELACZYŃSKA E., POBEREŻNY J., LAMPARSKI R., KOZERA W., KNAPOWSKI T. 2020. Effect of potato tuber biofortification with magnesium and the storage time on the content of nutrients. J. Elem., 25(2): 687-700. DOI: 10.5601/jelem.2019.24.4.1880
6. RADAWIEC A., RUTKOWSKA B., TIDABACK J.A., GOZDOWSKI D., KNAPOWSKI T., SZULC W. 2021. The impact of selenium fertilization on the quality characteristics of spring wheat grain. Agronomy, 11, 2100. https://doi.org/10.3390/agronomy11112100
7. WICHROWSKA D., KOZERA W., KNAPOWSKI T., PRUS P., LIGOCKA A. 2021. Assessment of the interactive effect of the use of 1-methylcyclopropene and cultivars on the nutritional value of broccoli during storage. Agronomy, 11, 12, 2575. http://212.122.198.131/cgi-bin/expertus/expertus3.exe#.
8. ŁOŚ SZ., FABISIAK K., PAPROCKI K., KOZERA W., KNAPOWSKI T., SZYBOWICZ M., DYCHALSKA A. 2022. The barrier's heights and its inhomogeneities on diamond silicon interfaces. Materials, 15(17), 5895, https://doi.org/10.3390/ma15175895
9. SZCZEPANEK M., KOZERA W., KNAPOWSKI T., PRUS P. 2022. Amino acids composition in ancient wheat species (*Triticum sphaerococcum* and *T. persicum*) and common wheat (*T. aestivum*) grown organically under plowing and shallow tillage. Book of abstracts: XVII. Congress of the European Society for Agronomy Diversification & Digitalisation – Trends that Shape Future Agriculture.
10. KOZERA W., SZCZEPANEK M., KNAPOWSKI T., TOBIASVA E., NOGALSKA A. 2023. Mineral composition and protein quality of organically grown ancient wheat under reduced tillage. Journal of Elementology, 28, 3, 773-791. https://doi.org/10.5601/jelem.2023.28.3.3051.
11. KNAPOWSKI T., KOZERA W., DUCSAY L. 2023. Assessment of the technological value of triticale grain fertilized with manure and microelements. Infrastructure and Ecology of Rural Areas, 18(1), 240-253. http://212.122.198.131/cgi-bin/expertus/expertus3.exe#.
12. LEMANOWICZ J., DĘBSKA B., LAMPARSKI R., MICHALSKA A., POBEREŻNY J., WSZELACZYŃSKA E., BARTKOWIAK A., SZCZEPANEK M., BANACH-SZOTT M., KNAPOWSKI T. 2023. Influence of Plant Growth Retardants and Nitrogen Doses on the Content of Plant Secondary Metabolites in Wheat, the Presence of Pests, and Soil Quality Parameters. Agriculture, 13(6), 1121, 1-22. http://212.122.198.131/cgi-bin/expertus/expertus3.exe#

**List of patents and protective works:**
lack

**List of active participation in conferences:**
lack

**List of scholarships and scientific internships:**

1. 2 - 28.02.2014 - internship at the Warsaw University of Life Sciences at the Faculty of Agriculture and Biology in the Department of Soil Environmental Sciences
2. 8 - 29.05.2015 - internship at the Department of Agro-chemistry and Plant Nutrition, as part of the international cooperation signed between the Faculty of Agriculture and Biotechnology of the University of Technology in Bydgoszcz and the Faculty of Agrobiology and Food Resources, Slovak University in Nitra

**List of participation in scientific grants:**

1. GRIST, project no. 00066.DDD.6509.00175.2022.11, *Organic grain production and processing of brewery residues into meal using an innovative method of dehydration* under the Rural Development Programme 2014-2020, implementation period: 01.08.2022 - 31.12.2024, Co-contractor
2. Grant - 73004/B/P01/2011/40, awarded by KBN, 2011–2015, Grant title: *Response of spelt wheat to differentiated nitrogen and micronutrient fertilization*. The main contractor,
3. Grant of the European Agricultural Fund for Rural Development: Europe investing in rural areas" - contract No. 00001.DDD.6509.00003.2017.02 Project title: *Innovations in the cultivation, processing and marketing of primary forms of round grain and Persian wheat with increased nutritional value.* Co-contractor,
4. Grant - 2 PGR 040 30, Title of the grant: *Investigation of the relationship between selected physical and quality characteristics of wheat grain and the severity of fusarium symptoms*. Co-contractor
5. Grant - 2 PO6 R 035 28, Title of the grant: *Fertilizer effect of sulphur in the soil-plant-crop system*. Co-contractor
6. Research project – Marshal's Office – agreement of 6.07.2007. I.3020-UDOT-758/2007, Project title: *Study of the content and amino acid composition of protein in the yields of fodder cereals collected in the Kujawsko-Pomorskie Voivodeship in 2007*. Co-contractor

**Other important academic and professional achievements:**

1. Reviewer of publications in international and national journals included in the Journal Citation Reports (JRC) database.
2. Member of the Polish Agronomic Society and the Polish Society of Magnesium (PTMag).
3. Organizer of the *Laboratory of Cereal Grain Quality Assessment for Food Processing* in the Laboratory of Environmental Chemistry and Agricultural Chemistry, Department of Biogeochemistry and Soil Science.
4. Scientific cooperation between the Laboratory of Environmental Chemistry and Agricultural Chemistry of the Faculty of Agrobiology and Food Resources, Department of Agro-chemistry and Plant Nutrition.

POLITECHNIKA BYDGOSKA
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HR EXCELLENCE IN RESEARCH

**CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER**

**Name:**
Mirosław Kobierski

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**
Professor, Agricultural Sciences, Agriculture and Horticulture

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

1. Innovative use of aluminosilicate minerals.

**List of functions of supervisor or assistant supervisor of doctoral dissertations:**

1. Katarzyna Kociniewska graduate of doctoral studies (graduation date 2016, initiation of doctoral conferment procedure in the field of Environmental Protection and Management);
2. Jose Matias Peñas Castejon from the Higher Technical School of Agricultural Engineering of the Technical University of Cartagena in Spain – international doctorate, which received distinction (defense 2017).
3. Piotr Ignaszak graduate of Doctoral Studies (graduation date 2021, initiation of doctoral conferment procedure in the field of agronomy, public defense of the dissertation November/December 2024);
4. Mateusz Pawłowski, 4th year student of the Doctoral School of the Bydgoszcz University of Technology; initiation of doctoral conferment procedure in the field of agricultural sciences, discipline of agriculture and horticulture.

**List of reviews in the procedure for scientific promotion:**

1. review of the application for the title of Professor of Jadwiga Stanek-Tarkowska in the field of agricultural sciences in the discipline of agriculture and horticulture, employed at the University of Rzeszów (October 2022);
2. review of the application for the title of Professor Jacek Sosnowski in the field of agricultural sciences, university professor at the Institute of Agriculture and Horticulture, Faculty of Agrobioengineering and Animal Sciences, University of Natural Sciences and Humanities in Siedlce (January 2024);
3. review in the habilitation procedure of Łukasz Uzarowicz, PhD, assistant professor at the Department of Soil Environmental Sciences, Department of Soil Science at the Warsaw University of Life Sciences (March 2019);
4. review in the habilitation procedure of Dr. Guillaume Debaene, assistant professor at the Department of Soil Science of Erosion and Environmental Protection, Institute of Soil Science and Plant Cultivation, National Research Institute in Puławy (October 2019);
5. review of the doctoral dissertation of Tymoteusz Bolewski, M.Sc., Eng., assistant at the Institute of Technology and Life Sciences in Bydgoszcz of the National Research Institute in Falenty (September 2023);
6. review of the doctoral dissertation of Hanna Radziuk, MSc, PhD student at the Nicolaus Copernicus University in Toruń (January 2023).

**List of scientific publications:**

1. In the field of agricultural sciences, discipline of agriculture and horticulture:
    1) Figas A., Kobierski M., Siwik-Ziomek A., Tomaszewska-Sowa M., Gruszka Z. 2024. Anthropression as a Factor Affecting the Content of Heavy Metals in the Flowers of Sambucus nigra L.-A Medicinal Plant Affecting Human Health. Sustainability.
    2) Becher M., Kobierski M., Pakuła K., Jaremko D. 2023. Distribution of Mercury in Drained Peatlands as the Effect of Secondary Transformation of Soil Organic Matter. Agriculture.
    Kobierski M., Banach-Szott M. 2022. Organic Matter in Riverbank Sediments and Fluvisols from the Flood Zones of Lower Vistula River, Agronomy.
    3) Kabała Cezary, Musztyfaga Elżbieta, Jary Zdzisław, Waroszewski Jarosław, Gałka Bernard, Kobierski Mirosław. 2022. Glossic planosols in the postglacial landscape of central europe: Modern polygenetic soils or subaerial palaeosols? Geoderma.
    4) Piotrowska-Długosz A., Kobierski M. Długosz J. 2021. Enzymatic Activity and Physicochemical
    5) Properties of Soil Profiles of Luvisols. Materials.
    6) Kobierski M., Jaskulska I., Jaskulski D., Dębska B., 2020. Effect of a tillage system on the chemical properties of sandy loam soils. Journal of Elementology.
    7) Kobierski M., Lemanowicz J., Wojewódzki P., Kondratowicz-Maciejewska K. 2020. The effect of organic and conventional farming systems with different tillage on soil properties and enzymatic activity. Agronomy.
2. In the field of exact and natural sciences, the discipline of earth and environmental sciences:
    1) Kobierski M., Cieścińska B., Cieściński J., Kondratowicz-Maciejewska K., 2020. Effect of soil management practices on the mineralization of organic matter and quality of sandy soils. Journal of Ecological Engineering.
    2) Waroszewski J., Sprafke T., Kabała C., Kobierski M., Kierczak J., Musztyfaga E., Loba A., Mazurek R., Łabaz B., 2019. Tracking textural, mineralogical and geochemical signatures in soils developed from basalt-derived materials covered with loess sediments (SW Poland) Geoderma.

**List of patents and protective works:**
lack

**List of active participation in conferences:**

1. XXX Jubilee International Scientific Conference "Infrastructure and Environment in circular economy" 16-19 June 2024, Bukowina Tatrzańska.
2. XXX International Scientific Conference under the patronage of the Minister of Agriculture and Rural Development "Problems of Sustainable Agriculture, Protection of Rural Areas, Water Resources and the Environment" Institute of Technology and Life Sciences – National Research Institute, Al. Hrabska 3, Falenty. September 16-18, 2024.
3. 13.01.2023 – 4th SUITMA International Seminar, Toruń.
4. XXV International Symposium on Plant Irrigation for Sustainable Rural Development, 12-15.06.2023, Bydgoszcz – Fojutowo.
5. International Conference in Burgas (Bulgaria) Agriculture & Food International Conference 14-17 August 2023.
6. Seminar "Precision and smart agriculture – status and prospects for implementation" as part of the project "European Green Deal – challenges and opportunities for Polish agriculture", 23-24 May 2023, Toruń.
7. Congress of the Soil Science Society of Poland 11-16.08.2023 in Poznań.

8. International Congress on Sustainable Development in the Human Environment - Current and Future Challenges (ICSDEV 2022), Alanya, Turkey, 19-22. October 2022

**List of scholarships and scientific internships:**
lack

**List of participation in scientific grants:**

1. Investigator in the grant financed by the Ministry of Science and Higher Education entitled "Factors determining changes in enzymatic activity and functional and genetic diversity of microorganisms in the soil profile in relation to diverse soil types and methods of their agricultural use" (Principal Investigator: prof. dr hab. Anna Piotrowska-Długosz) NCN Project 2018/29/B/NZ9/00982 (Research task carried out in 2019-2022). Number of points for the project - 18 (1 point for every PLN 50,000 in accordance with the Regulation of the Ministry of Science and Higher Education on the evaluation of the quality of scientific activity Journal of Laws No. 392 of 22 February 2019 (§22 sec. 4 point 1) 2 points – prof. dr hab. Mirosław Kobierski.
2. Contractor (2022) in the project entitled "Genesis and transformation of black earth soils in Poland against the background of climate change and the impact of settlement and human activity since the beginning of the Neolithic" as part of the OPUS-15 competition financed by the National Science Centre. Project B080/0006/19. Research task 01-B080/0006/19 (project leader: Beata Łabaz, PhD, DSc, Eng., prof. UW).
3. Contractor (2024) in the project entitled "Innovative solutions in low-carbon crop production combined with improved field descaling technology – an innovative practice to reduce the carbon footprint in the cultivation of rye, sugar beet and alfalfa using a field descaling machine, improving soil structure, efficiency of cultivation technologies and organizational skills on the farm". Research task V.A.5. Studies leading to the development of the Agri-Climate Change Tool (ACCT) monitoring, which allows for the preparation of carbon balances and energy audits, by an employee of the Silesian University of Technology in the degree of titular professor. Conducting soil analyses. Project 00135.DDD.6509.00117.2022.02 (project leader: prof. Anna Wenda-Piesik, PhD, DSc).

**Other important academic and professional achievements:**

1. From June 2023 to August 2024, I served as the chairman of the Scientific Council of the Discipline of agriculture and horticulture. At the same time, I was a member of the Team for Scientific Promotions of Employees at the Faculty of Agriculture and Biotechnology. In recent years, I have been and still am the Dean's representative for people with disabilities.
2. The year 2020 is the last year of membership in the Team for the Evaluation of the Internal Education Quality Assurance Systemappointed by the Rector. I was and am a member of the faculty team for the quality of education. In June 2021, I conducted a review of the scientific, didactic and organizational achievements of Jerzy Jonczak, PhD, applying for employment as a university professor in the group of research and teaching staff of the Department of Soil Science, Institute of Agriculture, Warsaw University of Life Sciences.
3. I evaluated the achievements of doctoral students of the Doctoral School (mid-term evaluation, 2022):
   a) University of Rzeszów,
   b) University of Life Sciences in Warsaw,
   c) of the University of Natural Sciences and Humanities in Siedlce.
4. As a result of the internationalization of the didactic offer (financing by the EU), I conducted classes for students of an international group (II o studies). I have conducted classes with

Erasmus+ students in Soil science, Soil morphology and I conduct classes: Instrumental analysis, Project with laboratory works; Soil protection and remediation. I was the scientific supervisor of 7 people doing a scientific internship from the Universities: Cartagena, Lublin, Łódź, Siedlce and Wrocław.

5. In the years 2020-2024, I was a supervisor in 23 diploma theses.
6. On 23/06/2021, as part of the project entitled "Investments in professionals 2", RPKP.10.01.03-04-0003/18, I conducted a training for students of a school from Karolewo. On 07/10/2021, I conducted scientific workshops for employees of Agro-Sieć Maszyny Sp. z o. o. The classes were carried out in the Laboratory of Soil Science and Biochemistry of the Bydgoszcz University of Technology entitled "Organoleptic determination of the granulometric group of soils and assessment of their morphological characteristics based on the structure of the profile".
7. In 2022, I twice took part in radio broadcasts (Radio PiK) popularizing knowledge about food security and spatial management of rural areas, environmental soil science in the curricula of fields of study at the Faculty of Agriculture and the Bydgoszcz University of Technology.

POLITECHNIKA BYDGOSKA
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# CRITERION 3

# Qualifications of academic teachers or research staff conducting education at the doctoral school

## animal science and fisheries

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# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name**:
Maria Siwek – Gapińska

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title**:

prof. dr hab. / field of agricultural sciences, discipline of animal sciences and fisheries / the title of professor obtained in 2019

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology**:

1. Doctoral seminar (Polish and English group)
2. Contemporary trends in the development of science (Polish and English group)
3. Animal research models

The following lists refer to the last 5 years, with particular emphasis on achievements related to classes conducted at the Doctoral School of the Bydgoszcz University of Technology.

**List of doctoral dissertation supervisor functions**:

1. Dr Arkadiusz Płowiec (PhD 2018)
2. Aleksandra Dunisławska, PhD, DSc, Associate Professor (PhD 2019)
3. Mgr Ramesha N. Wishn – Kadawarage (PhD student at SzD)
4. Modou Mangan, MSc (PhD student at the Faculty of Medicine)

**List of reviews in the procedure for scientific promotion**:

1. Professor's title: Magdalena Gryzińska, Andrzej Jakubczak, Dorota Wojtysiak
2. Habilitated Doctor: Klaudia Pawlina – Tyszko, Jakub Cieślak
3. PhD degree: Błażej Nowak, Justyna Ciechańska

**List of scientific publications**:

1. Wishna-Kadawarage RN, Hickey RM, Siwek M. In-vitro selection of lactic acid bacteria to combat Salmonella enterica and Campylobacter jejuni in broiler chickens. World J Microbiol Biotechnol. 2024 Mar 14; 40(4):133. DOI: 10.1007/s11274-024-03946-8. PMID: 38480610; PMCID: PMC10937796.
2. Wishna-Kadawarage RN, Poltowicz K, Dankowiakowska A, Hickey RM, Siwek M. Prophybiotics for in-ovo stimulation; validation of effects on gut health and production of broiler chickens. Poult Sci. 2024 Apr; 103(4):103512. doi: 10.1016/j.psj.2024.103512. Epub 2024 Feb 1st PMID: 38367472; PMCID: PMC10882136.
3. Manganese M, Siwek M. Strategies to combat heat stress in poultry production-A review. J anim physiol anim nutr (berl). 2023 Dec 27. doi: 10.1111/jpn.13916. Epub ahead of print. PMID: 38152002.
4. Matuska W, Matuska J, Skorupska E, Siwek M, Herrero P, Santafé MM. Can Myofascial Trigger Points Involve Nociplastic Pain? A Scoping Review on Animal Models. J Pain Res. 2023 Nov 8;16:3747-3758. doi: 10.2147/JPR. S422885. PMID:38026452; PMCID: PMC10640827

5. Dunisławska A, Gryzińska M, Siwek M. Changes in the gene expression and methylation in chicken cecal tonsils after in ovo administration of bioactive substances. Sci Rep. 2023 Nov 13; 13(1):19840. DOI: 10.1038/S41598-023-47080-1. PMID: 37964014; PMCID: PMC10645795.
6. Wishna-Kadawarage RN, Jensen M, Powałowski S, Hickey RM, Siwek M. In-vitro screening of compatible synbiotics and (introducing) "prophybiotics" as a tool to improve gut health. Int Microbiol. 2023 Aug 22. doi: 10.1007/s10123-023-00417-2. Epub ahead of print. PMID: 37608143.
7. Dunislawska A, Bełdowska A, Yatsenko O, Siwek M. Effect of prebiotics administered during embryo development on mitochondria in intestinal and immune tissues of adult broiler chickens. Poult Sci. 2023 Jun; 102(6):102663. doi: 10.1016/j.psj.2023.102663. Epub 2023 Mar 16. PMID: 37030257; PMCID: PMC10105484.
8. Dunisławska A, Pietrzak E, Wishna Kadawarage R, Siwek M. MicroRNA expression in immune tissues of adult chickens after embryo stimulation with bioactive substances. Sci Rep. 2023 Feb 22; 13(1):3076. DOI: 10.1038/s41598-023-30299-3. PMID: 36813917; PMCID: PMC9946929.
9. Tavaniello S, Sławińska A, Sirri F, Wu M, De Marzo D, Siwek M, Maiorano G. Corrigendum to Performance and meat quality traits of slow-growing chickens stimulated in ovo with galactooligosaccharides and exposed to heat stress [Poultry Science Volume 101, Issue 8, August 2022, 101972]. Poult Sci. 2022 Oct; 101(10):102080. DOI: 10.1016/j.psj.2022.102080. Epub 2022 Aug 26. Erratum for: Poult Sci. 2022 Aug; 101(8):101972. PMID: 36038411; PMCID: PMC9512654.
10. Tavaniello S, Sławińska A, Sirri F, Wu M, De Marzo D, Siwek M, Maiorano G. Performance and meat quality traits of slow-growing chickens stimulated in ovo with galactooligosaccharides and exposed to heat stress. Poult Sci. 2022 Aug; 101(8):101972. doi: 10.1016/j.psj.2022.101972. Epub 2022 May 21. Erratum in: Poult Sci. 2022 Oct; 101(10):102080. PMID: 35760001; PMCID: PMC9241043.
11. Dunisławska A, Biesek J, Banaszak M, Siwek M, Adamski M. Effect of zeolite supplementation on gene expression in the intestinal mucosa in the context of immunosafety support in poultry. Genes (Basel). 2022 Apr 22; 13(5):732. doi: 10.3390/genes13050732. PMID: 35627116; PMCID: PMC9140869.
12. Paradowska M, Dunisławska A, Siwek M, Sławińska A. Avian Cell Culture Models to study immunomodulatory properties of bioactive products. Animals (Basel). 2022 Mar 7; 12(5):670. doi: 10.3390/ani12050670. PMID: 35268238; PMCID: PMC8909239.
13. Dunisławska A, Sławińska A, Siwek M, Bednarczyk M. Epigenetic changes in poultry due to reprogramming of the gut microbiota. Anim Front. 2021 Dec 17; 11(6):74-82. doi: 10.1093/af/vfab063. PMID: 34934532; PMCID: PMC8683152.
14. Dunisławska A, Pietrzak E, Wishna Kadawarage R, Bełdowska A, Siwek M. Pre- hatching and post-hatching environmental factors related to epigenetic mechanisms in poultry. J Anim Sci. 2022 Jan 1; 100(1):skab370. DOI:10.1093/jas/skab370. PMID: 34932113; PMCID: PMC8826992.
15. Bogusławska-Tryk M, Ziółkowska E, Sławińska A, Siwek M, Bogucka J. Modulation of Intestinal Histology by Probiotics, Prebiotics and Synbiotics Delivered In Ovo in Distinct Chicken Genotypes. Animals (Basel). 2021 Nov 18; 11(11):3293. doi: 10.3390/ani11113293. PMID: 34828024; PMCID: PMC8614360.
16. Dunisławska A, Herosimczyk A, Ozgó M, Lepczyński A, Ciechanowicz AK, Bednarczyk M, Siwek M. Proteome changes upon in ovo stimulation with Lactobacillus synbiotic in chicken liver. Poult Sci. 2021 Nov; 100(11):101449. doi: 10.1016/j.psj.2021.101449. Epub 2021 Aug 29. PMID: 34601437; PMCID: PMC8531852.

17. Suchocki T, Czech B, Dunisławska A, Sławińska A, Derebecka N, Wesoły J, Siwek M, Szyda J. SNP prioritization in targeted sequencing data associated with humoral immune responses in chicken. Poult Sci. 2021 Nov; 100(11):101433. doi: 10.1016/j.psj.2021.101433. Epub 2021 Aug 19. PMID: 34551372; PMCID: PMC8458985.
18. Biesek J, Dunisławska A, Banaszak M, Siwek M, Adamski M. The Impact of Hydrated Aluminosilicates Supplemented in Litter and Feed on Chicken Growth, Muscle Traits and Gene Expression in the Intestinal Mucosa. Animals (Basel). 2021 Jul 28; 11(8):2224. doi: 10.3390/ani11082224. PMID: 34438682; PMCID: PMC8388497.
19. Dunisławska A, Siwek M, Stadnicka K, Bednarczyk M. Comparison of the Transcriptomic and Epigenetic Profiles of Gonadal Primordial Germ Cells of White Leghorn and Green-Legged Partridgelike Chicken Embryos. Genes (Basel). 2021 Jul 19; 12(7):1090. DOI: 10.3390/genes12071090. PMID: 34356106; PMCID: PMC8306151.
20. Dunisławska A, Sławińska A, Gryzińska M, Siwek M. Interaction between early in ovo stimulation of the gut microbiota and chicken host - splenic changes in gene expression and methylation. J Anim Sci Biotechnol. 2021 Jul 7; 12(1):73. DOI: 10.1186/s40104-021-00602-1. PMID: 34229755; PMCID: PMC8262062.
21. Sikorska M, Siwek M, Sławińska A, Dunisławska A. miRNA Profiling in the Chicken Liver under the Influence of Early Microbiota Stimulation with Probiotic, Prebiotic, and Synbiotic. Genes (Basel). 2021 May 1; 12(5):685. doi: 10.3390/genes12050685. PMID: 34062867; PMCID: PMC8147272.
22. Dunisławska A, Herosimczyk A, Lepczyński A, Slama P, Sławińska A, Bednarczyk M, Siwek M. Molecular Response in Intestinal and Immune Tissues to in Ovo Administration of Inulin and the Combination of Inulin and Lactobacillus lactis Subsp. cremoris. Front Vet Sci. 2021 Feb 3;7:632476. doi: 10.3389/fvets.2020.632476. PMID: 33614758; PMCID: PMC7886801.
23. Sławińska A, Dunisławska A, Płowiec A, Gonçalves J, Siwek M. TLR-Mediated Cytokine Gene Expression in Chicken Peripheral Blood Mononuclear Cells as a Measure to Characterize Immunobiotics. Genes (Basel). 2021 Jan 29; 12(2):195 DOI: 10.3390/genes12020195. PMID: 33572768; PMCID: PMC7912573.
24. Polewko-Klim A, Lesiński W, Golińska AK, Mnich K, Siwek M, Rudnicki WR. Sensitivity analysis based on the random forest machine learning algorithm identifies candidate genes for regulation of innate and adaptive immune response of chicken. Poult Sci. 2020 Dec; 99(12):6341-6354. DOI:10.1016/j.psj.2020.08.059. Epub 2020 Sep 12. PMID: 33248550; PMCID: PMC7704721.
25. Dunisławska A, Szczerba A, Siwek M, Bednarczyk M. Dynamics of the transcriptome during chicken embryo development based on primordial germ cells. BMC Res Notes. 2020 Sep 18; 13(1):441. DOI: 10.1186/S13104-020-05286-W. PMID: 32948222; PMCID: PMC7501632.
26. Madej JP, Skonieczna J, Siwek M, Kowalczyk A, Łukaszewicz E, Sławińska A. Genotype-dependent development of cellular and humoral immunity in the spleen and cecal tonsils of chickens stimulated in ovo with bioactive compounds. Poult Sci. 2020 Sep; 99(9):4343-4350. DOI: 10.1016/j.psj.2020.05.048. Epub 2020 Jun 24. PMID: 32867978; PMCID: PMC7598118.
27. Reszka P, Dunisławska A, Sławińska A, Siwek M, Kapelański W, Bogucka J. Influence of the effective microorganisms (EM) on performance, intestinal morphology and gene expression in the jejunal mucosa of pigs fed different diets. J anim physiol anim nutr (berl). 2020 Sep; 104(5):1444-1453. doi: 10.1111/JPN.13404. Epub 2020 Jun 26 32592200.
28. Dunisławska A, Sławińska A, Siwek M. Hepatic DNA Methylation in Response to Early Stimulation of Microbiota with Lactobacillus Synbiotics in Broiler Chickens. Genes

(Basel). 2020 May 21; 11(5):579. DOI: 10.3390/genes11050579. PMID: 32455682; PMCID: PMC7290315.
29. Dunisławska A, Siwek M, Sławińska A, Lepczyński A, Herosimczyk A, Kołodziejski PA, Bednarczyk M. Metabolic Gene Expression in the Muscle and Blood Parameters of Broiler Chickens Stimulated In Ovo with Synbiotics. Animals (Basel). 2020 Apr 15; 10(4):687. doi: 10.3390/ani10040687. PMID: 32326487; PMCID: PMC7222801.
30. Stefaniak T, Madej JP, Graczyk S, Siwek M, Łukaszewicz E, Kowalczyk A, Sieńczyk M, Maiorano G, Bednarczyk M. Impact of Prebiotics and Synbiotics Administered in ovo on the Immune Response against Experimental Antigens in Chicken Broilers. Animals (Basel). 2020 Apr 8; 10(4):643. DOI: 10.3390/ani10040643. PMID: 32276459; PMCID: PMC7222847.
31. Dunisławska A, Sławińska A, Siwek M. Validation of the Reference Genes for the Gene Expression Studies in Chicken DT40 Cell Line. Genes (Basel). 2020 Mar 30; 11(4):372. doi: 10.3390/genes11040372. PMID: 32235512; PMCID: PMC7230526.
32. Pietrzak E, Dunisławska A, Siwek M, Zampiga M, Sirri F, Meluzzi A, Tavaniello S, Maiorano G, Sławińska A. Splenic Gene Expression Signatures in Slow-Growing Chickens Stimulated in Ovo with Galactooligosaccharides and Challenged with Heat. Animals (Basel). 2020 Mar 12; 10(3):474. doi:10.3390/ani10030474. PMID: 32178295; PMCID: PMC7143207.
33. Stefaniak T, Madej JP, Graczyk S, Siwek M, Łukaszewicz E, Kowalczyk A, Sieńczyk M, Bednarczyk M. Selected prebiotics and synbiotics administered in ovo can modify innate immunity in chicken broilers. BMC Vet Res. 2019 Apr 3; 15(1):105. doi: 10.1186/s12917-019-1850-8. PMID: 30943971; PMCID: PMC6448256.
34. Dunisławska A, Sławińska A, Bednarczyk M, Siwek M. Transcriptome modulation by in ovo delivered Lactobacillus synbiotics in a range of chicken tissues. Gene. 2019 May 25;698:27-33. doi: 10.1016/j.gene.2019.02.068. Epub 2019 Mar 1. PMID: 30831211.
35. Sławińska A, Dunisławska A, Płowiec A, Radomska M, Lachmańska J, Siwek M, Tavaniello S, Maiorano G. Modulation of microbial communities and mucosal gene expression in chicken intestines after galactooligosaccharides delivery In Ovo. PLoS One. 2019 Feb 27; 14(2):e0212318. doi: 10.1371/journal.pone.0212318. PMID: 30811518; PMCID: PMC6392319.
36. Sławińska A, Mendes S, Dunisławska A, Siwek M, Zampiga M, Sirri F, Meluzzi A, Tavaniello S, Maiorano G. Avian model to mitigate gut-derived immune response and oxidative stress during heat. Biosystems. 2019 Apr;178:10-15. doi: 10.1016/j.biosystems.2019.01.007. Epub 2019 Jan 16. PMID: 30659866.

**List of patents and protective works**:

lack

**List of active participation in conferences**:

1. EAAP, Lyon, France, 2023
2. Polish Congress of Genetics, Krakow, 29.06.2022

**List of scholarships and scientific internships**:

lack

**List of participation in scientific grants**:

1. MGH, MonoGutHealth – H2020
2. "Molecular mechanisms of the gut-liver axis of chickens" UMO02562
3. "Risks of antibiotic contamination of feed" UMO04114
4. LEGO - Learning genomics for food safety, 2018-1-IT02-KA203-048522

5. In ovo stimulation of the hen microbiome - through the production of safe food without antibiotics. TANGO3/433847/NCBR/2019

**Other important academic and professional achievements**:

1. Member of the Scientific Council of the National Research Institute of Animal Production – term of office 2021 - 2025
2. Member of the Scientific Council of the Institute of Animal Nutrition Physiology – term of office 2023 - 2026
3. Member of the KNZiA PAS, term of office 2020 – 2023 and 2024 - 2027
4. Member of the university committee for POLon 2.0
5. Member of the faculty Strategy Team for the discipline
6. Chair of the Ministerial Team for Scientific Journals, 2019
7. Participation in scientific societies - EAAP, WPSA, Marie Curie Alumni Association
8. Member of the European Commission's expert panel (2019, 2020, 2021); Member of the NAWA expert panel (2019, 2020) – active membership, evaluation of applications

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# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Aleksandra Dunisławska

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

Habilitated doctor of agricultural sciences in the discipline of animal science and fisheries - 2022
Doctor of agricultural sciences in the discipline of biotechnology – 2019
Master of Science in Biotechnology - 2014

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**
Contemporary trends in the development of science (2h)

**List of functions of supervisor or assistant supervisor of doctoral dissertations:**

1. Aleksandra Bełdowska, MSc, Eng., Intestinal response to stimulation with prebiotic and postbiotic administered *in ovo* during embryonic development of broiler chickens (promoter function, PBŚ)
2. MSc Muhammad Zeeshan Akram, Different access-to-feed strategies and nutritional strategies to improve broiler performance and flock homogeneity (second supervisor function, KU Leuven)

**List of reviews in the procedure for scientific promotion:**

1. Daria Ciecholewska-Juśko, PhD, Eng., Development and characterization of bionanocellulose materials for the prevention of colonization by pathogenic microorganisms and for the eradication of bacterial biofilms, 2023, WPUT Szczecin
2. Michał Broda, Ph.D., Eng., The process of bacterial cellulose production using a potato-based production medium and an analysis of the possibility of using the obtained biomaterial, 2024, WPUT Szczecin

**List of scientific publications:**

1. Sławińska A., Mendes S., Dunisławska A., Siwek M., Zampiga M., Sirri F., Meluzzi A., Tavaniello S., Maiorano G., Avian model to mitigate gut-derived immune response and oxidative stress during heat. *Biosystems* (2019). (IF: 1.808)
2. Sławińska A., Dunisławska A., Płowiec A., Radomska M., Lachmańska J., Siwek M., Tavaniello S., Maiorano G. Modulation of microbial communities and mucosal gene expression in chicken intestines after galactooligosaccharides delivery *in ovo. PLoS ONE* (2019), 14(2): e0212318. (IF: 2.740)
3. Dunisławska A., Sławińska A., Bednarczyk M., Siwek M. Transcriptome modulation by *in ovo* delivered *Lactobacillus* synbiotics in a range of chicken tissues. *GENE* (2019), 698, 27-33. (IF: 2.984)
4. Pietrzak E., Dunisławska A., Siwek M., Zampiga M., Sirri F., Meluzzi A., Tavaniello S., Maiorano G., Sławińska A. Splenic gene expression signatures in slow-growing chickens stimulated in ovo with galactooligosaccharides and challenged with heat. *Animals* (2020), 10, 747. (IF: 2.323)

5. Dunisławska A., Sławińska A., Siwek M., Validation of Reference Genes for the Gene Expression Studies in Chicken DT40 Cell Line. *Genes (*2020), 11, 372. (IF: 3.759)
6. Dunisławska A., Siwek M., Sławińska A., Lepczyński A., Herosimczyk A., Kołodziejski P., Bednarczyk M., Metabolic gene expression in the muscle and blood parameters of broiler chickens stimulated *in ovo* with synbiotics. *Animals (*2020), 10, 687. (IF: 2.323)
7. Dunisławska A., Sławińska A., Siwek M., Hepatic DNA Methylation in Response to Early Stimulation of Microbiota with Lactobacillus Synbiotics in Broiler Chickens. *Genes* (2020), *11*(5), 579. (IF: 3.759)
8. Dunisławska A., Szczerba A., Siwek M., Bednarczyk M., Dynamics of the transcriptome during chicken embryo development based on primordial germ cells. *BMC research notes* (2020), *13*(1), 1-6. (IF: 1.340)
9. Reszka P., Dunisławska A., Sławińska A., Siwek M., Kapelański W., Bogucka J. Influence of the effective microorganisms (EM) on performance, intestinal morphology and gene expression in the jejunal mucosa of pigs fed different diets. *Journal of Animal Physiology and Animal Nutrition* (2020), *104*(5), 1444-1453. (IF: 1.597)
10. Sławińska, A.; Dunisławska, A.; Plowiec, A.; Gonçalves, J.; Siwek, M. TLR-Mediated Cytokine Gene Expression in Chicken Peripheral Blood Mononuclear Cells as a Measure to Characterize Immunobiotics. *Genes* 2021, *12*, 195 (IF: 4.096)
11. Dunisławska A., Herosimczyk A., Lepczyński A., Slama P, Sławińska A., Bednarczyk M., Siwek M. Molecular response in intestinal and immune tissues to in ovo administration of inulin and the combination of inulin and *Lactobacillus lactis* subsp. *cremoris. Frontiers in Veterinary Science (*2021) (IF: 3.412)
12. Dunisławska A., Sławińska A., Gryzińska M., Siwek M. Interaction between early in ovo stimulation of the gut microbiota and chicken host – splenic changes in gene expression and methylation. *Journal of Animal Science and Biotechnology*. 2021, 12, 73. (IF: 5.032)
13. Sikorska M., Siwek M., Sławińska A, Dunisławska A. miRNA Profiling in the Chicken Liver under the Influence of Early Microbiota Stimulation with Probiotic, Prebiotic, and Synbiotic. *Genes.* 2021, 12(5), 685. (IF: 4.096)
14. Dunisławska A., Siwek M., Stadnicka K., Bednarczyk M. Comparison of the Transcriptomic and Epigenetic Profiles of Gonadal Primordial Germ Cells of White Leghorn and Green- Legged Partridgelike Chicken Embryos. *Genes* 2021, 12, 1090 (IF: 4.096)
15. Biesek J., Dunisławska A., Banaszak M., Siwek M., Adamski M. The Impact of Hydrated Aluminosilicates Supplemented in Litter and Feed on the Chicken Growth, Muscle Traits and Gene Expression in the Intestinal Mucosa. *Animals* 2021, 11.2224 . (IF: 2.752)
16. Bednarczyk M., Dunisławska A., Stadnicka K., Grochowska E. Chicken embryo as a model in epigenetic research. *Poultry Science*, 2021, 100:101164. (IF: 3.352)
17. Suchocki, T., Czech, B., Dunisławska, A., Sławińska, A., Derebecka, N., Wesoły, J., Siwek M. & Szyda, J. (2021). SNP prioritization in targeted sequencing data associated with humoral immune responses in chicken. *Poultry science*, *100*(11), 101433. (IF: 3.352)
18. Dunisławska, A., Herosimczyk, A., Ozgo, M., Lepczyński, A., Ciechanowicz, A. K., Bednarczyk, M., & Siwek, M. (2021). Proteome changes upon in ovo stimulation with Lactobacillus synbiotic in chicken liver. *Poultry Science*, *100*(11), 101449. (IF: 3.352)
19. Dunisławska, A., Sławińska, A., Siwek, M., & Bednarczyk, M. (2021). Epigenetic changes in poultry due to reprogramming of the gut microbiota. *Animal Frontiers*, *11*(6), 74-82 (IF: 3.338) – *article by invitation from the editorial board*
20. Dunislawska, A. (2021). 161 Epigenetic Changes in Poultry Due to Reprogramming of the Gut Microbiota at an Early Stage of Embryonic Development. *Journal of Animal Science*, *99*(Suppl 3), 85. (IF: 3.338)
21. Dunisławska, A., Pietrzak, E., Wishna Kadawarage, R., Bełdowska, A., & Siwek, M. (2022). Pre-hatching and post-hatching environmental factors related to epigenetic mechanisms in

poultry. *Journal of Animal Science*, *100*(1), skab370 (IF: 6.762) – *article by invitation from the editorial board*

22. Paradowska, M., Dunislawska, A., Siwek, M., & Sławińska, A. (2022). Avian Cell Culture Models to Study Immunomodulatory Properties of Bioactive Products. *Animals*, *12*(5), 670 (IF: 3.231)
23. Dunisławska, A., Biesek, J., Banaszak, M., Siwek, M., & Adamski, M. (2022). Effect of Zeolite Supplementation on Gene Expression in the Intestinal Mucosa in the Context of Immunosafety Support in Poultry. *Genes*, *13*(5), 732 (IF: 4.141)
24. Dzięgielewska, A., & Dunislawska, A. (2022). Mitochondrial Dysfunctions and Potential Molecular Markers in Sport Horses. *International Journal of Molecular Sciences*, *23*(15), 8655 (IF: 6.208)
25. Marynowska, M., Herosimczyk, A., Lepczyński, A., Barszcz, M., Konopka, A., Dunisławska, A., & Ożgo, M. (2022). Gene and Protein Accumulation Changes Evoked in Porcine Aorta in Response to Feeding with Two Various Fructan Sources. *Animals*, *12*(22), 3147 (IF: 3.321)
26. Bełdowska, A., Barszcz, M., & Dunisławska, A. (2023). State of the art in research on the gut-liver and gut-brain axis in poultry. *Journal of Animal Science and Biotechnology*, *14*(1), 37. (IF: 6.3)
27. Dunislawska, A., Pietrzak, E., Wishna Kadawarage, R., & Siwek, M. (2023). MicroRNA expression in immune tissues of adult chickens after embryo stimulation with bioactive substances. *Scientific Reports*, *13*(1), 3076. (IF 3.8)
28. Dunisławska, A., Gryzińska, M., & Siwek, M. (2023). Changes in the gene expression and methylation in chicken cecal tonsils after in ovo administration of bioactive substances. *Scientific Reports*, *13*(1), 19840. (IF 3.8)
29. Dunisławska, A., Pietrzak, E., Bełdowska, A., Sławińska, A., & Siwek, M. (2023). Response in liver gene expression and DNA methylation to changes in the intestinal microbial profile after in ovo stimulation of chickens. Journal of Animal and Feed Sciences, 32(2), 152-163. (IF: 1.4)
30. Wlaźlak, S., Pietrzak, E., Biesek, J., & Dunisławska, A. (2023). Modulation of the immune system of chickens a key factor in maintaining poultry production—a review. *Poultry Science*, *102*(8), 102785. (IF 3.8)
31. Dunisławska, A., Herosimczyk, A., Lepczyński, A., Pietrzak, E., Ciechanowicz, A. K., Ożgo, M., Kucia M. & Bednarczyk, M. (2023) *In ovo* stimulation with Lactobacillus synbiotic induces changes in hepatic proteins involved in the de novo biosynthesis of purines, energetic metabolism and stress prevention in broiler chickens. Annals of Scientific Animal Production, 50, 2, 279-285.
32. Wypych, A., Dunisławska, A., Grabowska, M., Michałek, K., Ożgo, M., Liput, K., ... & Lepczyński, A. (2023). Effects of three-month feeding high-fat diets with different fatty acid composition on kidney histology and expression of genes related to cellular stress and water-electrolyte homeostasis in mice. *J. Anim. Feed Sci*, *32*, 372-384. (IF: 1.4)
33. Dunislawska, A., Bełdowska, A., Yatsenko, O., & Siwek, M. (2023). Effect of prebiotics administered during embryo development on mitochondria in intestinal and immune tissues of adult broiler chickens. *Poultry Science*, *102*(6), 102663. (IF: 3.8)
34. Bełdowska, A., Pietrzak, E., Biesek, J., Barszcz, M., Tuśnio, A., Konopka, A., ... & Dunisławska, A. (2024). The effect of sodium butyrate administered in ovo on the health status and intestinal response in broiler chicken. *Poultry Science*, *103*(10), 104108. (IF: 3.8)
35. Biesek, J., Dunisławska, A., & Kozdruń, W. (2024). The effect of coffee husks used as pellet bedding material on the intestinal barrier, immune-related gene expression and microbiota composition in the broiler chicken caecum. Sciendo. *Journal of Veterinary Research*, *68*(3), 443-449.
36. Bełdowska, A., Siwek, M., Biesek, J., Barszcz, M., Tuśnio, A., Gawin, K., & Dunisławska, A. (2024). Impact of in ovo administration of xylo-and mannooligosaccharides on broiler chicken gut health. *Poultry Science*, *103*(12), 104261. (IF: 3.8)

37. Dunisławska, A., Biesek, J., & Adamski, M. (2024). Growth performance, carcass composition, and qualitative meat features of broiler chickens after galactooligosaccharides and sodium butyrate in ovo administration. *Poultry Science*, *103*(10), 104094. (IF: 3.8)
38. Akram Z. M., Everaest N., Dunislawska A. (2024) In ovo sodium butyrate administration differentially impacts growth performance, intestinal barrier function, immune response, and gut microbiota characteristics in low and high hatch-weight broilers. Journal of Animal Science and Biotechnology – in press

**Monographs/chapters in monographs:**

1. Chapter in the book *Water in Biomechanical and Related Systems* edited by A. Gadomski (Biologically-inspired systems series); chapter: Siwek M., Sławińska A., Dunisławska A**.,** *Water in livestock – biological role and global perspective on water demand and supply chains*, 2021; ISSN: 2211-0593, Springer Publishing House (pp. 315-331)
2. Chapter in the book *Medical Physics - Models and Technologies in Cancer Research* under the reading of A. Bajek and B. Tylkowski; chapter: Sobolewska A., Dunisławska A., Stadnicka K., *Natural substances in cancer—do they work*?, 2021; ISBN: 9783110662306, Wydawnictwo deGruyter (pp. 103-136)
3. Stadnicka K., Dunisławska A., Tylkowski, B. (eds.). (2023). *Poultry Science: The Many Faces of Chemistry in Poultry Production and Processing*. Walter de Gruyter GmbH & Co KG.

**List of patents and protective works:**
lack

**List of active participation in conferences:**

1. Poster presentation*: Epigenetic changes in immune-related tissues inducted by an early chicken microbiome reprogramming via probiotic, prebiotic and synbiotic*, 14th International Scientific Conference on Probiotics, Prebiotics, Gut Microbiota and Health - International Probiotics Conference 2020, 11.11.2020
2. Poster presentation: *Epigenetic regulation of the immune gene expression by early chicken microbiome reprogramming via bioactive substances in ovo*, 71st Annual Meeting of the European Federation of Animal Science 2020, 1-4.12.2020
3. Poster presentation: *Omics techniques for the analysis of the gut-liver axis after in ovo delivery of synbiotic,* 71st Annual Meeting of European Federation of Animal Science 2020, 1-4.12.2020
4. Oral presentation (invited): *In ovo strategies to improve resilience through gut health in chickens*, 71st Annual Meeting of European Federation of Animal Science 2020, 1-4.12.2020
5. Oral presentation (invited): *Epigenetic changes in poultry due to reprogramming of the gut microbiota at an early stage of embryonic development* ASAS-CSAS-SSASAS Annual Meeting & Trade Show 2021, American Society of Animal Science and Canadian Society of Animal Science, 14- 17.07.2021, Louisville, USA
6. Poster presentation: *MicroRNA expression in immune-related tissues after in ovo stimulation with bioactive substances*, 73rd Annual Meeting of European Federation of Animal Science 2022, 5-8.09.2022, Porto, Portugal
7. Oral presentation (invited): Response of the gut-liver axis to stimulation during embryonic development in chickens, The 10th Beneficial Microbes Conference, 27-29.11.2023, Amsterdam, the Netherlands

**List of scholarships and scientific internships:**

1. Aarhus University, Department of Molecular Biology and Genetics, Center of Quantitative Genetics and Genomics, Denmark; 03.2018-04.2018

**List of participation in scientific grants:**

1. Principal investigator of the PRELUDIUM project funded by the National Science Centre (NCN) "*Epigenetic regulation of gene expression in hens after administration of prebiotic and synbiotic in ovo*", project no. UMO-2017/25/N/NZ9/01822, 2018- 2022
2. Principal investigator of the SONATA project funded by the National Science Centre "ActEpi: Activation of epigenetic mechanisms in poultry by programming the gut microbiota" project no. UMO- 2021/43/D/NZ9/01548, 2022 – 2025
3. WP5 leader in the MonoGutHealth project, which received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 955374 (Marie Curie-Skłodowska Programme) 2022-2024
4. Co-investigator, project of the Ministry of Science and Higher Education "*Analysis of SNP mutations within candidate genes associated with innate and specific immune response in chickens*" – principal investigator: prof. dr hab. M. Siwek (project no. N N311 558640) 2013-2015
5. Co-investigator, European project under the Seventh Framework Programme "*Monogastrics Feed Efficiency; ECO FCE. A whole-systems approach to optimise feed efficiency and reduce the ecological footprint of monogastrics*" - task leader prof. M. Bednarczyk (project no. FP7-KBBE-2012-6) 2014- 2017
6. Investigator, OPUS NCN "*The use of targeted next-generation DNA sequencing for the analysis of the genetic basis of innate and acquired immune response in chickens*" – principal investigator: prof. dr hab. M. Siwek (project no. UMO-2014/13/B/NZ9/02123) 2015 – 2019
7. Investigator, OPUS NCN "*Synbiotic-activated TLR signalling pathway as a measure of improvement of immune parameters in chickens*" - principal investigator: prof. dr eng. A. Sławińska (project no. UMO-2013/11/B/NZ9/00783) 2015 – 2018
8. Contractor, MIUR (Ministero dell'Istruzione dell'Università e della Ricerca) based in Rome "SIR/OVOBIOTIC - *In ovo delivery of prebiotic in commercial and indigenous Italian chicken breeds provides a contribution to healthy food production under a heat stress*" Project implemented in cooperation with the University of Molise in Campobasso (Italy) 2016 – 2019
9. Investigator, OPUS NCN "*Primary germ cells - a new approach to epigenetic studies in chickens"* – principal investigator: prof. dr hab. M. Bednarczyk (project UMO- 2017/27/B/NZ9/01510) 2018 – 2021
10. Investigator, OPUS NCN "*Research on the intergenerational and multigenerational phenotypic and epigenetic effect of in ovo stimulation of the hen embryo"* – principal investigator: prof. dr hab. Marek Bednarczyk (project 2020/37/B/NZ9/00497) 2021-2023
11. Co-Investigator, TANGO NCBiR "OVO-FOOD – "In *ovo stimulation of the hen microbiome – the way to the production of safe food without antiniotics*" – Principal Investigator: Anna Sławińska, PhD, DSc, Eng. (project DWP/TANGO-III/322/2019) 2019 – 2020
12. Contractor, "*Safe Farm – product, process and marketing innovation related to broiler chicken breeding*" implemented in 2020-2022 as part of the co-financing of the "European Agricultural Fund for Rural Development: Europe investing in rural areas" by the Agency for Restructuring and Modernisation of Agriculture, task leader: Mirosław Banaszak, PhD, 2020 – 2022
13. Investigator, OPUS NCN "*Molecular mechanisms of the enterohepatic axis in chickens*" - principal investigator: prof. dr hab. inż. Maria Siwek-Gapińska (project UMO-2021/41/B/NZ9/02562) 2022-2025
14. Investigator OPUS NCN "*Risks associated with contamination of feed with antibiotics*" – principal investigator: dr hab. Małgorzata Olejnik, prof. UMK (project UMO-2021/41/B/NZ9/04114) 2022-2025
15. Investigator: SONATA NCN: "*Multiomics studies of the digestive system and phenotypic traits of ducks fed with feed with the addition of aluminosilicates*" – principal investigator: Mirosław Banaszak, PhD, DSc, Eng., prof. PBŚ (project UMO-2021/43/D/NZ9/01756) 2022-2025
16. Investigator: Science for Society of the Ministry of Science and Higher Education II "*Naturally safe poultry production – good biosecurity practices and sustainable production*" – principal

investigator: Jakub Biesek, PhD, DSc, Eng., prof. PBŚ (project NdS-II/SP/0516/2024/01) 2024-2027

**Other important academic and professional achievements:**

1. Scholarship of the Minister of Science and Education for outstanding young scientists, 2023
2. Prime Minister's Award in the category of distinguished doctoral dissertation, 2020
3. Distinction of the Marshal of the Kujawsko-Pomorskie Voivodeship in 2020-2021 in the category of Agriculture and Rural Development
4. The title of the Innovation Leader of Pomerania and Kujawy for the team for the solution entitled "Implementation and application of the results of the project 2019-2022: Safe Farm – product, process and markering innovation in chicken rearing with the use of aluminosilicates", 2023
5. Scholarship of the Minister of Science and Higher Education for PhD students for outstanding scientific achievements, 2017
6. Europan Federation of Animal Science EAAP Fellowship for Young Scientists, 2017

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# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Radomir Graczyk

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

Hab. / Biological sciences, 2025

Ph.D. / Agricultural Sciences, Zootechnics, 2011

MSc / Environmental Protection, 2003

Eng. / Environmental Protection, 2001

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

Statistical verification of research hypotheses

**List of functions of supervisor or assistant supervisor of doctoral dissertations:**

1. Hanna Szczukowska, M.Sc., Eng., 15 December 2008, PhD dissertation entitled "The effect of fertilization with pig and goat manure on the meadow acarofauna"
2. Acting as an assistant supervisor in the doctoral dissertation of Bartosz Kaszyński, M.Sc., Eng., June 17, 2014, PhD dissertation entitled "The impact of natural fertilization on the diversity of meadow mites with particular emphasis on Oribatida"

**List of reviews in the procedure for scientific promotion:**
lack

**List of scientific publications:**

Scientific monographs

1) Radomir Graczyk. 2020. Mosses (Acari, Oribatida) of selected microhabitats of single-storey dry forests *Cladonio-Pinetum* on forest and post-agricultural lands. University Publishing Houses of the University of Technology and Life Sciences in Bydgoszcz

Scientific publications in journals with IF

1) Graczyk R., Chachaj B., Stanek M., Dąbrowski J., Gackowski G. 2019. Fertility of Spiny-Cheek Crayfish (Orconectes limosus Raf.) from the Vistula Lagoon. Bulletin of Environmental Contamination and Toxicology 102(3), 365-370. https://doi.org/10.1007/s00128-019-02543-y
2) Seniczak A., Seniczak S., Graczyk R., Waldon-Rudzionek B., Nowicka A., Pacek S. 2019. Seasonal dynamics of Mites (Acari, Oribatida) in a Bog in Poland. Wetlands, 1-12. https://doi.org/10.1007/s13157-019-01125-2
3) Stadnicka K., Bogucka J., Stanek M., Graczyk R., Krajewski K., Maiorano G., Bednarczyk M. 2020. Injection of Raffinose Family Oligosaccharides at 12 Days of Egg Incubation Modulates the Gut Development and Resistance to Opportunistic Pathogens in Broiler Chickens. Animals 10(4) 592, 1-19. https://doi.org/10.3390/ani10040592

4) Pacek S., Seniczak A., Graczyk R., Chachaj B., Waldon-Rudzionek B. 2020. The effect of grazing by geese, goats, and fallow deer on soil mites (Acari). Turkish Journal of Zoology, 44, TÜBİTAK, 254-265. https://doi.org/10.3906/zoo-1910-22
5) Pacek S., Seniczak S., Graczyk R., Chachaj B., Seniczak A. 2020. Seasonal dynamics of mites (Acari) in pastures and meadows in Poland, with species analysis of Oribatida. Acarologia 60(4), 668-683. https://doi.org/10.24349/acarologia/20204395
6) Szczepanek M., Lemańczyk G, Lamparski R., Wilczewski E., Graczyk R., Nowak R., Prus P. 2020. Ancient Wheat Species (Triticum sphaerococcum Perc. and T. persicum Vav.) in Organic Farming: Influence of Sowing Density on Agronomic Traits, Pests and Diseases Occurrence, and Weed Infestation. Agriculture 10(11), 556, 1-21, https://doi.org/10.3390/agriculture10110556
7) Szczepanek M., Baczyński M., Graczyk R. 2021. Effects of Plant Growth Regulators and N Rate on the Morphological Traits of Generative Tillers and Seed Yields of Chewings and Strong Creeping Red Fescue. Agronomy, 11(65), 1-15, https://doi.org/10.3390/agronomy11010065
8) Seniczak A., Seniczak S., Graczyk R., Kaczmarek S., Jordal B.H., Kowalski J., Djursvoll P., Roth S., Bolger T. 2021. A Forest Pool as a Habitat Island for Mites in a Limestone Forest in Southern Norway. Diversity, 13, 578. https://doi.org/10.3390/d13110578
9) Szczepanek M., Lemańczyk G.; Nowak R.; Graczyk R. 2022. Response of Indian Dwarf Wheat and Persian Wheat to Sowing Density and Hydrothermal Conditions of the Growing Seasons. Agriculture, 12(2), 205. https://doi.org/10.3390/agriculture12020205
10) Gryn-Rynko A., Hołyńska-Iwan I., Janiak M., Olszewska-Słonina D., Amarowicz R., Graczyk R. 2022. The impact of Morus alba L. leaf extract on intestinal ion transport. An in vitro study. Biomedicine & Pharmacotherapy, 150, 112939. https://doi.org/10.1016/j.biopha.2022.112939
11) Szczepanek M., Siwik-Ziomek A., Lemańczyk G., Lamparski R., Graczyk R. 2023. Effect of reduced tillage on soil enzyme activity, pests pressure and productivity of organically grown spring wheat species. Agronomy, 13(2), 287, https://doi.org/10.3390/agronomy13020287
12) Graczyk R., Indykiewicz P., Olszewski A., Tobółka M. 2023. Mites Living in the Nests of the White Stork and Black Stork in Microhabitats of the Forest Environment and Agrocenoses. Animals, 13, 3189. https://doi.org/10.3390/ani13203189
13) Jagódka D., Kaczorek-Łukowska E., Graczyk R., Socha P. 2023. Vaginal aerobic bacteria of healthy bitches and those with fertility problems. Polish Journal of Veterinary Sciences, 26(4), 733-739 https://www.doi.org/10.24425/pjvs.2023.148293
14) Nowak R., Szczepanek M., Błaszczyk K., Graczyk R. 2024. Productivity of Alternative Barley Genotypes under Variable Intraspecific Competition Resulting from Increasing Sowing Density. Agronomy, 14, 2275. https://doi.org/10.3390/agronomy14102275

Scientific publications in other journals

1) Codrow H., Wierzbicka A., Graczyk R. 2021. Hunting opportunities for hunters not associated in hunting clubs. Acta Sci. Pol. Silv. Colendar. Ratio Ind. Lignar., 20(4), 207–216. http://dx.doi.org/10.17306/J.AFW.2021.4.20
2) Codrow H., Graczyk R., Wierzbicka A. 2023. Involvement of local and non-local hunters in the tasks of the hunting club as exemplified by wkł 294 Hubertus in Bydgoszcz in the period of time before and during the Covid-19 pandemic. Polish Journal of Natural Sciences, 38(3), 185-196, https://doi.org/ 10.31648/pjns.9258

**List of patents and protective works:**
lack

**List of active participation in conferences:**

Oral presentations

1) Banaszak M., Graczyk R., Biesek J., Wlaźlak S., Grycza M. 2023. Development of a method of dry sanitation using aluminosilicate mixtures in livestock facilities in the form of recommendations supporting the reduction of the impact of selected arthropod species as disease vectors in poultry production. VII. International Congress on Domestic Animal Breeding, Genetics and Husbandry - (ICABGEH-23) Kraków, Poland

Poster presentations

1) Graczyk R., Seniczak A. 2019. Age structure of Oribatida in Cladonio-pinetum dry forests. XXXVI Acarological Symposium, Tryszczyn
2) Patorska A., Błażejewicz-Zawadzińska M., Graczyk R. 2023. The frequency of occurrence of endoparasites among dogs. VII. International Congress on Domestic Animal Breeding, Genetics and Husbandry - (ICABGEH-23) Kraków, Poland
3) Graczyk R., Banaszak M., Biesek J., Wlaźlak S. 2023. Bedding mites and insects in livestock facilities in terms of dry sanitizatiion using aluminosilucate mixtures. VII. International Congress on Domestic Animal Breeding, Genetics and Husbandry - (ICABGEH-23) Kraków, Poland

**List of scholarships and scientific internships:**

1) Scholarship under the project "Step into the future – scholarships for doctoral students" co-financed by the European Social Fund and the State Budget under Measure 2.6. "Regional Innovation Strategies and Knowledge Transfer" of the Integrated Regional Development Programme, for the academic year 2006/2007, awarded to me in a competition by the Marshal of the Kuyavian-Pomeranian Voivodeship for the implementation of scientific research on the topic: "The impact of cattle slurry fertilization on the acarofauna of permanent grassland".
2) Scholarship under the project "Scholarships for PhD students 2008/2009 – ZPORR", co-financed by the European Social Fund of the European Union and the State Budget and the Budget of the Kujawsko-Pomorskie Voivodeship, awarded to me in a competition by the Marshal of the Kujawsko-Pomorskie Voivodeship for the implementation of scientific research on the topic: "The impact of cattle slurry fertilization on the acarofauna of permanent grassland".
3) Scholarship under the project "Step into the future – scholarships for doctoral students III edition" implemented in the academic year 2009/2010 under Measure 8.2 Transfer of knowledge, Sub-measure 8.2.2 Regional Innovation Strategies of the Human Capital Operational Programme, co-financed by the European Social Fund of the European Union and the State Budget and the Budget of the Kujawsko-Pomorskie Voivodeship, awarded to me in a competition by the Marshal of the Voivodeship Kujawsko-Pomorskie for the implementation of scientific research on the topic: "The effect of cattle slurry fertilization on the acarofauna of permanent grassland".

1) Scientific internship. Sogn og Fjordane University College, Department of Landscape (HSF, AIN) in Sogndal (Norway), from 20.08.2005 to 21.09.2005, improvement of professional qualifications, the aim of the internship was to participate in acarological research works (collection of research material from various microhabitats within agrocenoses of traditional farms and forest habitats, laboratory work with the use of, m.in biological and stereoscopic microscopes, learning to determine mites, preliminary analysis of results, review of scientific literature).
2) Scientific internship. University of Molise Campobasso, Italy, Department of Agricultural, Environmental and Food Sciences, from 01.05.2019 to 31.07.2019, improvement of professional qualifications, objective: participation in research work on the effect of in ovo injection of bioactive

substances on the performance of chickens in the production environment and expanding knowledge in the field of statistical methods used in biochemical analyses.

**List of participation in scientific grants:**

1) Project "Innovations in the cultivation, processing and marketing of primary forms of round grain and Persian wheat with increased nutritional value 00001.DDD.6509.00003.2017.02", implemented in the years 2018 – 2021, financed by the European Agricultural Fund for Rural Development: Europe Investing in rural areas, participation in the project 01.2020 – 12.2020 as a contractor of statistical analyses of the obtained data of long-term, multi-point experiments.
2) Project "Norwegian Forest Oribatida (NFO) - highly diverse, but poorly known" Universitetet Bergen, Felles Fakturamottak, Pb-7800, N-5020 Bergen, Norway, Organization Number: 874 789 542, implemented in 2018 – 2020, financed by the Norwegian Taxonomy Initiative, participation in the project: 10.2019 – 03.2020 as a contractor of species identification with juvenile stages of forest mites from the suborder Oribatida of the forest community.
3) The project "New quality at UTP" implemented under Priority IV Higher education and science, Measure 4.1 Strengthening and development of the teaching potential of universities and increasing the number of graduates of faculties of key importance for the knowledge-based economy, Sub-measure 4.1.1 Strengthening the teaching potential of universities of the Human Capital Operational Programme. The project is co-financed by the European Union under the European Social Fund. The POKL project. 04.01.01-00-006/11-00, as a participant 2013/2014
4) Grant for pre-implementation works – increasing the level of implementation readiness (TRL) implemented by the UTP SCUEP SCUTP consortium as part of the "INNOVATION INCUPAT 4.0" project. The project is co-financed by the Ministry of Science and Higher Education from the "Innovation Incubator 4.0" program under the Smart Growth Operational Program Measure 4.4 Increasing the human resources potential of the B+R sector, as a member of the 2021 – 2023 team.
5) Science for Society II project (NdS-II/SP/0516/2024/01) implemented as part of basic and development research entitled "Naturally safe poultry production – good biosecurity practices and sustainable production" financed by the Ministry of Education and Science, member of the research team, 2024 – 2027.

**Other important academic and professional achievements:**

1) Polish Acarological Society – membership from 2011 to the present; Member of the Audit Committee from 2019 to the present
2) Polish Society of Animal Production – membership from 2023 to now
3) Coordinator for compensatory programmes – 1.6.2011 – 28.2.2015 in the Project UDA-POKL.04.01.02-00-166/11 "Engineering studies as a guarantee of the development of UTP and knowledge-based society" under the Human Capital Operational Programme, Priority IV Higher education and science, Measure 4.1. Strengthening and developing the teaching potential of universities and increasing the number of graduates of faculties of key importance for the knowledge-based economy Sub-measure 4.1.2. Increasing the number of graduates of faculties of key importance for the knowledge-based economy, project financed by the European Social Fund and the state budget under Sub-measure 4.1.2. of the Operational ProgrammeHuman Capital
4) Review of the project proposal: NCN research project (panel NZ8) 2011/03/B/NZ8/00030 "Parthenogenesis in Oribatida mechs: testing the hypothesis of the role of bacterial endosymbionts", Adam Mickiewicz University in Poznań, May 2012.
5) Since 2011, 25 reviews of scientific papers.

6) Preparation of an expert opinion "Ecophysiographic development for the local spatial development plan for the area of "fordon-rynek" in Bydgoszcz, Study on request: Pracownia Ochrony Środowiska PRO GAJA, Hanna Bukowska, Expertise and Design in the field of environmental protection, Design of green areas, 85-120 Bydgoszcz, 33/3 Nowodworska Street; October 2008
7) Cooperation with Przedsiębiorstwo Produkcyjno-Handlowa VIT-TRA, Kusowo, 86–022 Dobrcz, 2006 – 2007, objective: use of the disinfectant "Vit-Tra disinfectant" with bactericidal, fungicidal and virucidal properties in research on the effect of fertilization with natural fertilizers on soil acarofauna of permanent grassland.
8) Implementation of didactic classes from the academic year 2005/2006 for students of environmental protection, agritourism, zoos, zootechnics, veterinary inspection, zoophysiotherapy, zoophysiotherapy and animal care.
9) Supervising foreign PhD students and Erasmus+ trainees from Norway (2008), Spain (2013, 2016), Turkey (2015) and Delaware State University, Dover, USA (2019).
10) Implementation of classes for foreign students under the Erasmus+ program in the subjects of Eco-development in Forestry (year 2012/2013), Agroecology, Forest Acarology (year 2015/2016), Aquaristics, Plankton and culture techniques (year 2016/2018).
11) Since 2012, he has been supervising full-time first-cycle students (completed engineering theses – 36) and full-time second-cycle students (completed master's theses – 22).
12) Since 2006, he has been the supervisor of the Student Scientific Club of Animal Ecology.
13) In order to improve my professional qualifications and skills, I have so far completed 18 certified trainings and courses and 15 non-certified trainings.
14) As part of my organizational activities, since 2012 I have performed numerous functions for the University.

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Beata Sitkowska

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

animal sciences and fisheries, 2019

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

Bioinformatics

**List of functions of supervisor or assistant supervisor of doctoral dissertations:**

1. Joanna Aerts, 2023. Factors determining the performance of a herd of cows in barns equipped with an automatic milking system. PBS Bydgoszcz
2. Oliwia Duszyńska-Stolarska, 2018. Analysis of the influence of polymorphism of selected genes of the somatotropin axis in relation to selected milk performance traits in cows. PBS Bydgoszcz
3. Daria Karwowska, 2018. Genetic polymorphism of selected genes of Polish merino sheep and hybrids and its relationship with functional traits. PBS Bydgoszcz

**List of reviews in the procedure for scientific promotion:**

1. Review of the doctoral dissertation of Mariusz Meller, MSc, Eng. entitled "Analysis of selected functional traits of half-sisters and sisters genomically assessed within bovine maternal lines" (Szczecin, 2022)
2. Review of the doctoral dissertation of Katarzyna Woźniak, MSc, entitled "Structural analysis of the HK2 gene in the aspect of pig performance traits and pork meat quality parameters" (Kraków, Balice 2023)

**List of scientific publications (for the last 5 years):**

1. Sitkowska, B., Yüksel, H. M., Piwczyński, D., & Önder, H. (2024). Heritability and genetic correlations of rumination time with milk-yield and milking traits in Holstein-Friesian cows using an automated milking system. Animal, 18(3), 101101.
2. Sobczyński, B., Piwczyński, D., Siatka, K., Sitkowska, B., Kolenda, M. (2024). Efficiency of Utilizing Bulls with High Immune Response (HIR) in Terms of Reproductive Traits of PHF Cows. Animals, 14(15), 2144.
3. Sobczyński, B., Piwczyński, D., Sitkowska, B., Wójcik, P., Kolenda, M., 2024 The effectiveness of using bulls with increased immune response in terms of milk yield, milk contents, and somatic cell count in Polish Holstein-Friesian cows. Annals of Animal Science.
4. Piwczyński, D., Siatka, K., Sitkowska, B., Kolenda, M., Özkaya, S., Gondek, J. (2023). Comparison of selected parameters of automated milking in dairy cattle barns equipped with a concentrate feeding system. Animal, 17(12), 101011.

5. Önder, H., Sitkowska, B., Kurnaz, B., Piwczyński, D., Kolenda, M., Şen, U., Tırınk, C., Çanga Boğa, D. (2022). Multi-Trait Single-Step Genomic Prediction for Milk Yield and Milk Components for Polish Holstein Population. Animals, 13(19), 3070.
6. Aerts J., Kolenda M., Piwczyński D., Sitkowska B., Önder H. (2022). Forecasting Milking Efficiency of Dairy Cows Milked in an Automatic Milking System Using the Decision Tree Technique. Animals, 12(8), 1040.
7. Ocak Yetisgin S., Önder H.,„Sen U., Piwczyński D., Kolenda M., Sitkowska B., Yucel C. (2022). Farmers' Risk Perception on Climate Change: Transhumance vs. Semi-Intensive Sheep Production Systems in Türkiye. Animals 2022, 12, 1992. https://doi.org/10.3390/ani12151992
8. Ghiasi H., Sitkowska B., Piwczyński D., Kolenda M. (2022). Genetic Parameters for Methane Emissions Using Indirect Prediction of Methane and Its Association with Milk and Milk Composition Traits. Animals 2022, 12, 2073. https://doi.org/10.3390/ani12162073
9. Aerts J., Sitkowska B., Piwczyński D., Kolenda M., Önder H. (2022). The optimal level of factors for high daily milk yield in automatic milking system. Livestock Science, 264, 105035.
10. Piwczyński, D., Kretkowski, J., Sitkowska, B. Longevity of auto-milked Polish Holstein-Friesian cows. Zootechnical News, R. LX (2022), 3–4: 3–12.
11. Şen, U., Şirin, E., Önder, H., Özyürek, S., Kolenda, M., Sitkowska, B. (2022). Macromolecules influence cellular competence and expression level of IGFs genes in bovine oocytes in vitro. Animals, 12(19), 2604.
12. Kurnaz B., Onder H., Piwczyński D., Kolenda M., Sitkowska B. (2021). Determination of the Best Model to Predict Milk Dry Matter in High Milk Yielding Dairy Cattle. Acta Scientiarum Polonorum. Zootechnica, 20(3).
13. Kolenda M., Sitkowska B., Kamola D., Lambert B.D. (2021). Composite genotypes of progestogen-associated endometrial protein gene and their association with composition and quality of dairy cattle milk. Animal Bioscience 34(8): 1283–1289. https://doi.org/10.5713/ab.20.0596
14. Ghafoor N.A., Sitkowska B. (2021). MasPA: A Machine Learning Application to Predict Risk of Mastitis in Cattle from AMS Sensor Data. AgriEngineering 3, 3: 575-583. https://doi.org/10.3390/agriengineering3030037
15. Aerts J., Piwczyński D., Ghiasi H., Sitkowska B., Kolenda M., Önder H. (2021). Genetic Parameters Estimation of Milking Traits in Polish Holstein-Friesians Based on Automatic Milking System Data. Animals, 11(7), 1943.
16. Kolenda M., Sitkowska B. (2021). The polymorphism in various milk protein genes in Polish Holstein-Friesian dairy cattle. Animals 11(2), 389.
17. Kolenda M., Sitkowska B., Kamola D., Lambert B.D. (2021) Composite genotypes of progestogen-associated endometrial protein gene and their association with composition and quality of dairy cattle milk. Anim Biości. 34(8):1283-1289. doi: 10.5713/ab.20.0596. Epub 2021 Feb 15th PMID: 33677915; PMCID: PMC8255884.
18. Piwczyński D., Sitkowska B., Ptak E. (2021). Genetic relationship among somatic cell score and some milking traits in Holstein-Friesian primiparous cows milked by an automated milking system. Animal, 15(2), 100094.
19. Piwczyński D., Sitkowska B., Brzozowski M., Bogucki M., Wójcik P. (2021). Survival of Polish Holstein-Friesian cows to second, third and fourth lactation in conventional and automatic milking systems, Annals of Animal Science, DOI: 10.2478/aoas-2021-0010
20. Ghiasi H., Piwczyński D., Sitkowska B., González-Recio O., 2021. New composite trait to joint improvement in milk and fertility trait in Holstein dairy cow. Animal Bioscience 2021; 34(8): 1303-1308.

21. Kliś P., Piwczyński D., Sawa A., Sitkowska B., 2021. Prediction of Lactational Milk Yield of Cows Based on Data Recorded by AMS during the Periparturient Period. Animals, 11(2), 383.
22. Kolenda M., Piwczyński D., Brzozowski M., Sitkowska B., Wójcik P., 2021. Comparison of yield, composition and quality of milk of Polish Holstein-Friesian cows in conventional and automatic milking systems. Annals of Animal Science, 21(2), 709-720.
23. Piwczyński D., Kolenda M., Gondek J., Sitkowska B., 2021. Comparison of Parameters of Automatic Milking in Selected Countries in European Union and United States. Livestock Studies, 61(1), 1-8, https://doi.org/10.46897/livestockstudies.610101
24. Sitkowska B., Piwczyński D., Kolenda M., Różańska-Zawieja J., 2020. The milking frequency of primiparous cows in their early stage of lactation and its impact on milking performance. Animal Production Science, 60(3), 436-443
25. Sitkowska B., Kolenda M., Piwczyński D., 2020. Comparison of the fit of automatic milking system and test-day records with the use of lactation curves. Asian-Australasian Journal of Animal Sciences, 33(3), 408
26. Brzozowski M.P., Piwczyński D., Sitkowska B., Bogucki M., Sawa A., 2020. The impact of introduction of an automatic milking system on production traits in Polish Holstein-Friesian cows. Animal Science Papers and Reports, 38(1), 49-59
27. Sitkowska B., Piwczyński D., Kolenda M., 2020. Somatic cell count and other milk and milking parameters at an udder quarters' level in the automatic milking system. Animal Production Science - Manuscript AN18644. R2.
28. Piwczyński D., Gondek J., Sitkowska B., Kolenda M., 2020. Results coming from robotic milking system in selected countries in Europe and U.S. from 2014-2017. JCEA, 21(2), 187-196. Doi:/10.5513? JCEA01/21.2.2559
29. Sitkowska, B., Piwczyński, D., Kolenda, M., 2020. The relationships between udder-quarter somatic-cell counts and milk and milking parameters in cows managed with an automatic milking system. Animal Production Science. DOI:10.1071/AN18644.
30. Piwczyński D., Brzozowski M., Sitkowska B., 2020. The impact of the installation of an automatic milking system on female fertility traits in Holstein-Friesian cows. Livestock Science, 240, 104140. DOI:10.1016/j.livsci.2020.104140
31. Piwczyński D., Sitkowska B., Kolenda M., Brzozowski M., Aerts J., Schork P.M., 2020. Forecasting the milk yield of cows on farms equipped with automatic milking system with the use of decision trees. Animal Science Journal 91:e13414
32. Kolenda M., Piwczyński D., Brzozowski M., Sitkowska B., 2020. Comparison of yield, composition and quality of milk of Polish Holstein-Friesian cows in conventional and automatic milking systems. ANNALS OF ANIMAL SCIENCE ISSN: 2300-8733, DOI: 10.2478/aoas-2020-0101
33. Gozdek M., Kolenda M., Kamola D., Sitkowska B., 2020. Report on the incidence of hereditary disorders (BLAD, DUMPS) in the Polish population of Holstein-Friesian cattle. Acta Sci. Pol. Zootechnica 19(3):3-10
34. Stkowska B., Piwczyński D., Kolenda M., 2019. The milking frequency of primiparous cows in their early stage of lactation and its impact on milking performance. Animal Production Science, 60(3), 436-443.

**List of patents and protective works:**
lack

**List of active participation in conferences:**

1. Sitkowska Beata, Piwczyński Dariusz, Sieć Kamil, 2024. Relationship between body condition scores and lactation performance in Polish Holstein-Friesian dairy cattle. VIII. International Congress on Domestic Animal Breeding, Genetics and Husbandry - 2024 (ICABGEH-24)

September 23 - 25, 2024 – Antalya, Türkiye, p.p. 218 – on-line presentation, hybrid participation

2. Węglewska Katarzyna, Sitkowska Beata, 2023. The relationship between urea levels and dairy cattle reproduction rates. LXXXVII Scientific Congress of the Michał Oczapowski Polish Society of Animal Production, Section of Cattle Breeding and Breeding, Wrocław, 13-15.09.2023
3. Sitkowska Beata, Mert Yüksel Hüseyin, Piwczyński Dariusz, Önder Hasan, 2023. Heritability and repeatability of rumination time and milk yield traits of cows in an automatic milking system. LXXXVII Scientific Congress of the Michał Oczapowski Polish Society of Animal Production, Section of Cattle Breeding and Breeding, Wrocław, 13-15.09.2023 – summary, poster session, book of abstracts page 20
4. Sitkowska Beata, Hüseyin M. Yuksel, Dariusz Piwczyński, Hasan Onder, 2023. Genetic correlations between rumination time and milking traits in polish holstein-friesian cows. VII. International Congress on Domestic Animal Breeding, Genetics and Husbandry - 2023 (ICABGEH-23) Kraków, Poland, 18-20.09.2023 – abstract, poster, book abstracts page 196
5. Sitkowska B., Kolenda M., Piwczyński D., 2022. Life expectancy and use and the reasons for culling cows in herds before and after the introduction of the automatic milking system. LXXXVI Jubilee Scientific Congress of the Michał Oczapowski Polish Society of Animal Production, Section of Cattle Breeding and Breeding, Kraków, 20-22.09.2022, p. 26
6. Sitkowska B., Rząsińska J., Kolenda M., Piwczyński D., 2022. Types of farrowing in dairy cattle herds. LXXXVI Jubilee Scientific Congress of the Michał Oczapowski Polish Society of Animal Production, Cattle Breeding and Breeding Section, Kraków, 20-22.09.2022, p. 27
7. Sitkowska B., Kolenda M., Kamola D., Piwczyński D., Lach Z., Lewicz Ł., 2020. Frequency of milk protein genes in Polish Holstein-Friesian cows. EAAP, Porto - Remote Presentation, Hybrid Participation
8. Sitkowska B., Kolenda M., Kamola D., Lach Z., Lewicz Ł., 2020. Polymorphism in β-casein and κ-casein genes and milk performance of Polish Holstein-Friesian cows. EAAP, Porto - Remote Presentation, Hybrid Participation
9. Sitkowska B., Piwczyński D., Kolenda M., Akyol A., 2019. Somatic Cell Count and the Quarter Level of Milk Yield, Milking Duration, Time in Box, Milk Flow and Milk Conductivity in Polish Dairy Cows Milked Using Automatic Milking System. I International Congress of the Turkish Journal of Agriculture – Food Science and Technology, (TURJAF 2019). Congress Book (E-ISBN: 978-605-80461-1-5), 08-10.11.2019 Antalya – Turkey, 695 – remote speech, hybrid participation

**List of scholarships and scientific internships:**

1. Scientific internship, place and date: Ondokuz Mayıs University, Department of Animal Science, Turkey, remote internship, 14/06/2021-26/06/2021 and 19/07/21-30/09/2021
2. From 2.03.2020 to 13.03.2020 she completed a scientific internship at the Department of Cattle Breeding, Institute of Animal Production of the National Research Institute Balice. The internship included learning comprehensive analysis of the cow genome using SNP microarrays, including laboratory and bioinformatics analysis.

**List of participation in scientific grants:**

1. Ministry of Science and Higher Education, Implementation doctorate: Innovative solutions in dairy cattle herd management – year of submission 2021 (award of funding, resignation of PhD student after 2nd year of project funding)

2. Contractor of the project carried out in 2014-2015 co-financed by the National Science Centre contract no. 1641/B/H03/2010/38, NN114164138 entitled: "Consumer attitudes towards the issue of welfare of farm animals".

**Other important academic and professional achievements:**

1. Scientific activities include the scope of breeding, rearing and genetics of dairy cattle kept in barns equipped with various milking systems.
2. Statistical analysis of zootechnical data (detection of factors contributing to the optimization of cows for milking in the milking robot)
3. Analysis of cattle populations in terms of polymorphism of selected genes
4. Study of the genetic structure of selected cow populations
5. Analysis of traits related to cattle reproduction
6. In the years 2014-2017, I participated in the project "Effectiveness of genomic evaluation of young bulls in the field of functional traits" carried out with the participation of employees of the Faculty of Animal Breeding and Biology, ALTA Polska Sp. z o. o. and 7 agricultural plants from all over Polish dealing with dairy cattle breeding and PAN IZOO Kraków.

POLITECHNIKA BYDGOSKA
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HR EXCELLENCE IN RESEARCH

# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Mirosław Banaszak

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

1. 2023 obtaining the degree of habilitated doctor, field of agricultural sciences/animal sciences and fisheries,
2. 2014 obtaining a doctoral degree in agricultural sciences/zootechnics.

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

1. Contemporary trends in the development of science
2. Contemporary Trends in Scientific Development

**List of functions of supervisor or assistant supervisor of doctoral dissertations:**
lack

**List of reviews in the procedure for scientific promotion:**
lack

**List of scientific publications:**

1. Peng M., Tavaniello S., Banaszak M., Wlaźlak S., Palazzo M., Grassi G., Maiorano G. 2024. Comparison of Fatty Acid profile in Egg Yolk from Late-Age Hens Housed in Enriched Cages and in Free Range System. Animals, 14(7),1099,1-2. https://doi.org/10.3390/ani14071099
2. Biesek J., Wlaźlak S., Grabowicz M., Banaszak M. 2024. Evaluation of coffee husks in pellet bedding, performance characteristics, footpad dermatitis scoring, and meat quality of broiler ducks. Veterinary research Communications, 45, 165-177. http://212.122.198.131/cgi-bin/expertus/expertus3.exe#
3. Wlaźlak S., Biesek J., Banaszak M. 2024. Growth performance, meat quality, strength of jejunum and leg bones of both sexes Cherry Valley ducks fed with zeolite. Scientific reports, 14, 3938, 1-11 http://212.122.198.131/cgi-bin/expertus/expertus3.exe#
4. Wlaźlak S., Brzycka Z., Ragus W., Banaszak M., Grabowicz M. 2024. Quality characteristics, lysozyme activity, and albumen viscosity of fresh hatching duck eggs after a week's storage at various temperatures. Scientific Reports, 14, 5616, 1-9. http://212.122.198.131/cgi-bin/expertus/expertus3.exe#
5. Wegner M., Gęsek M., Banaszak M., Adamski M., Wlaźlak S., Biesek J. 2024. Research Note: The infectious bursal disease (Gumboro disease) vaccination scheme affects the quantitative carcass characteristics and the immune response of Ross 308 broiler chicken. Poultry Science, 103 (12) c 104344, 1-5. http://212.122.198.131/cgi-bin/expertus/expertus3.exe#
6. Biesek J., Banaszak M., Grabowicz M., Wlaźlak S. 2023. Chopped straw and coffee husks affect bedding chemical composition and the performance and foot pad condition of broiler chickens. Scientific Reports, 13, 6600. https://doi.org/10.1038/s41598-023-33859-9

7. Biesek J., Wlaźlak S., Banaszak M., Grabowicz M. 2023. Evaluation of coffee husks in pellet bedding, performance characteristics, footpad dermatitis scoring, and meat quality of broiler ducks. Veterinary Research Communications, available online 21 August 2023 https://doi.org/10.1007/s11259-023-10196-w
8. Biesek J., Banaszak M., Wlaźlak S., Adamski M. 2023. Use of coffee husks – comparison of pellet bedding quality, performance features, and some welfare indicators of broiler chickens. BMC Veterinary Research, 19, 182, http://dx.doi.org/10.1186/s12917-023-03749-3
9. Banaszak M., Biesek J., Adamski M. 2022. Research Note: Growth and Meat Features of Broiler Chicken with The Use of Halloysite as a Technological Additive to Feed and Peat Litter. Poultry Science, 101(1), 101543, https://doi.org/10.1016/j.psj.2021.101543
10. Banaszak M., Biesek J., Adamski M. 2022. Aluminosilicates at Different Levels in Rye Litter and Feed Affect the Growth and Meat Quality of Broiler Chickens. Veterinary Research Communications, 46(1), 37 – 47, https://doi.org/10.1007/s11259-021-09827-x
11. Biesek J., Banaszak M., Wlaźlak S., Adamski M. 2022. The effect of partial replacement of milled finisher feed with wheat grains on the production efficiency and meat quality in broiler chickens. Poultry Science, 101(5), 101817, https://doi.org/10.1016/j.psj.2022.101817
12. Dunisławska A., Biesek J., Banaszak M., Siwek M., Adamski M. 2022. Effect of zeolite supplementation on gene expression in the intestinal mucosa in the context of immunosafety support in poultry. Genes, 13(5), 732, https://doi.org/10.3390/genes13050732
13. Biesek J., Banaszak M., Kądziołka K., Wlaźlak S., Adamski M. 2022. Growth of broiler chickens, and physical features of the digestive system, and leg bones after aluminosilicates used. Scientific Reports, 12, 20425, https://doi.org/10.1038/s41598-022-25003-w
14. Biesek J., Banaszak M., Grabowicz M., Wlaźlak S., Adamski M. 2022. Production efficiency and utility features of broiler ducks fed with feed thinned with wheat grain. Animals, 12(23), 3427, https://doi.org/10.3390/ani12233427

**List of patents and protective works:**

1. Patent application No. P443393, entitled: "Bedding material in the form of pellets used as a substrate in animal keeping, and the method of its production" by Biesek J., Wlaźlak S., Banaszak M., Gotowska M., Adamski M.

**List of active participation in conferences:**

1. Wlaźlak S., Banaszak M., Biesek J. Production results and characteristics of Cherry Valley broiler ducks fed with halloysite. Florence, Italy, 19 September 5, 2024; 75$^{th}$ Annual Meeting of the European Federation of Animal Science
2. Graczyk R., Banaszak M., Biesek J., Wlaźlak S. Roztocze and insects in bedding material in hen rearing. Krakow, Poland, June 25-28, 2024; 38th Acarological Symposium
3. Święch E., Tuśnio A., Barszcz M., Gawin K., Biesek J., Banaszak M. The effect of zeolite supplementation in the diet on mucin concentration and selected histological parameters in the ileum and caecum of ducks. Lublin, Poland, September 16-18, 2024; XXXIV International Poultry Symposium WPSA Science for Practice – Practice for Science
4. Graczyk R., Banaszak M., Biesek J., Wlaźlak S. 2024. Bedding mites and insects in livestock facilities in terms of dry sanitization using aluminoskilicate mixtures. Krakow, Poland, September 18-20, 2023; ICABGEH-23
5. Banaszak M., Graczyk R., Biesek J., Wlaźlak S., Grycza M. Development of method of dry sanitization using aluminoslicate mixture in livestock facilities in the form of recommendations supporting the reduction of the impact of selected arthropod species as

disease vectors in poultry production. Krakow, Poland, September 18-20, 2023 ; ICABGEH - 23

6. Wlaźlak S., Biesek J., Banaszak M. Growth performance and slaughter yield of broiler ducks fed a diet with 1% zeolite addition. Krakow, Poland, September 18-20, 2023; ICABGEH - 23

**List of scholarships and scientific internships:**
lack

**List of participation in scientific grants:**

1. SONATA 17, National Science Centre; Multiomic studies of the digestive system and phenotypic traits of ducks fed with aluminosilicate-added feed (2021/43/D/NZ9/01756); 2022 – 2025
2. Safe Farm – Rural Development Programme 2014-2020; product, process and marketing innovation related to broiler chicken breeding; 2020-2022

**Other important academic and professional achievements:**

1. Member of the Scientific Council of WIPASZ S.A. – from 2023.

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# CRITERION 3

# Qualifications of academic teachers or research staff conducting education at the doctoral school

## management and quality studies

**Characteristics of academic teachers and other persons conducting classes at the Doctoral School of the Bydgoszcz University of Technology**

| Name: | **Iwona Posadzińska** |
|---|---|
| Academic title/field, academic degree/field and discipline, professional title (in the case of the professional title of doctor – specialization), year of obtaining the academic title/degree/professional title: | |
| Doctor of Economic Sciences, discipline: management and quality sciences | |
| List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology. | |
| Modern types of leadership<br>Seminar | |
| Supervisor's care. | |
| Małgorzata Grzeszczak, Accounting Information System in the Management of Small and Medium-sized Enterprises, Częstochowa University of Technology, Faculty of Management 2022<br>Marek Jóźwiak, Sustainable tourism management in the light of changes in the organizational culture of enterprises, in the process of<br>Patrycja Sieg, Management of post-industrial revitalization projects on the tourist market, in preparation | |
| Characteristics of scientific achievements, indicating the fields of science/art and the discipline/discipline(s) of science/arts in which the achievements fall (up to 600 characters) and a list **of at least 10** most important scientific/artistic achievements, with particular emphasis on the last 6 years, together with an indication of the dates of obtaining (scientific publications/artistic achievements, patents and protection rights, completed research projects, national/international awards for scientific/artistic achievements), with particular emphasis on achievements related to the field of study and the classes conducted in it. | |
| His scientific achievements are related to the process of implementing marketing strategies in the business to business sphere, creating a market position in the context of choosing a brand strategy and building image and identity. Particular attention was paid to the process of implementing and communicating corporate social responsibility. His achievements include research and publications on building internal and external relations between business market participants, including leadership. Study of the phenomenon of globalization and internationalization of enterprises in the construction market.<br>1. Posadzińska I. , Grzeszczak M., Management Accounting System in the Management of an Intelligent Energy Sector Enterprise, Energies 2022<br>2. Posadzińska I. , Sieg P., Jóźwiak M., New product concept development as an effect of revitalizing the Old Market in Bydgoszcz, Scientific Papers of Silesian University of Technology – Organization and Management 2022<br>3. Jóźwiak M., Sieg P., Posadzińska I., Revitalization of Mill Island Cultural Facilities as a Factor of the Region's Attractiveness and Competitiveness, Sustainability 2022<br>4. Karaszewski R., Posadzińska I., Drewniak R., Drewniak Z., Słupska U., Relational capital in business, University Publishers UTP, Bydgoszcz 2020<br>5. Drewniak R., Słupska U., Posadzińska I., Leadership and Internal Relational Capital of Enterprises, European Research Studies Journal 2020 | |

6. Drewniak R., Drewniak Z., Posadzińska I., Leadership Styles and Employee Expectations, European Research Studies Journal 2020
7. Klemke-Pitek M., Posadzińska I., EVALUATION OF THE USE OF EU FUNDS ALLOCATED TO PUBLIC SERVICES DEVELOPMENT IN LOCAL GOVERNMENT ADMINISTRATION IN POLAND, Scientific Papers of the Silesian University of Technology. Organization and Management 2019
8. Słupska U., Posadzińska I., Karaszewski R., Knowledge Management and Internal Relational Capital versus Development of Relations with Environment, in: Proceedings of the 15th European Conference on Management, Leadership and Governance, ECMLG 2019 / Mesquita Anabela, Silva Paulino 2019
9. Posadzińska I., Strategies for Internationalization of Polish Construction Companies, Entrepreneurship and Management 2018
10. Drewniak R., Goździewska-Nowicka A., Posadzińska I., Voss G., Conditions of the activity of small and medium-sized enterprises : Leadership, Marketing, Budget, Wyd. I, CeDeWu Sp. z o. o., Warsaw 2017

Characteristics of the experience and didactic achievements (up to 600 characters) and a list **of at least 10** most important teaching achievements, with particular emphasis on the last 6 years, together with an indication of the dates of obtaining (e.g. authorship of textbooks/teaching materials, implemented didactic innovations, awards obtained by students over whom the academic teacher supervised scientifically/artistically, supervision of the Diamond Grant beneficiary, launch of a new one). field of study/specialisation/classes/group of classes, supervision of a research club, conducting classes in a foreign language, including at a foreign university, e.g. as part of the mobility of academic teachers).

His didactic achievements concern education in the field of management concepts, as well as marketing management in the sphere of business to business. Specific areas include – selected classic and modern management concepts, organizational and decision-making techniques, leadership, design of marketing elements.

Teaching achievements:

1. MOOC project: University as a Creator of SME Human Resources Competences POWR.03.01.00-00-W021/18-00 2020-2021– project manager
2. Authorship of teaching materials – Modern marketing – electronic course available on the Novica platform
3. Award of the Mayor of the City of Bydgoszcz for the best master's thesis – Patrycja Sieg, thesis entitled: Development of post-industrial facilities on the example of the TeH2O industrial thematic trail in Bydgoszcz, 2020
4. Gold Medal for Long Service, 2018
5. Medal of the National Education Commission, 2020

Description of professional experience in connection with the learning objectives and learning outcomes assumed at the Doctoral School.

Professional experience related to the development of company valuations, restructuring programs, marketing analyses, prospectuses; main works in the field of the market of wood, furniture, pharmaceutical and construction companies; sector analysis of the cement industry in Poland; Marketing specialist - analysis of the market of construction products and construction services, introduction of new products to the market, preparation and implementation of promotional strategies.

Training

International scientific activity:

Projects

NCN project - Relational competences in creating enterprise value. The role of leadership and communication in relations with the environment, implementation period: 02.2018-12.2019, No. 2017/25/B/HS4/02135.

MOOC project: University as a Creator of SME Human Resources Competences POWR.03.01.00-00-W021/18-00 2020-2021– project manager

Conferences

- 15th European Conference on Management, Leadership and Governance, ECMLG 2019 / Mesquita Anabela, Silva Paulino
- Economic Informatics Congress, V - X Scientific Conference "Knowledge and Information Technologies in Creating Entrepreneurship", Scientific Society for Economic Informatics and Department of Information Management Systems at the Faculty of Management of the Częstochowa University of Technology, 2019-2023
- National Scientific Conference in the series "Competitiveness and development of regions in the conditions of European integration and globalization. Status – Trends – Strategies, Faculty of Management, Bydgoszcz University of Technology, 2014-2023
- Human Capital in Enterprise and Economy – An Interdisciplinary Perspective, University of Szczecin, 2021-2022

Scholarships and internships

**Characteristics of academic teachers and other persons conducting classes at the Doctoral School of the Bydgoszcz University of Technology**

| Name: | **Paweł Modrzyński** |
|---|---|
| Academic title/field, academic degree/field and discipline, professional title (in the case of the professional title of doctor – specialization), year of obtaining the academic title/degree/professional title: | |
| PhD in economics, obtained in 2008 | |
| List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology. | |
| Use of modern technologies in management processes | |
| Supervisor's care. | |
| | |
| Characteristics of scientific achievements, indicating the fields of science/art and the discipline/discipline(s) of science/arts in which the achievements fall (up to 600 characters) and a list **of at least 10** most important scientific/artistic achievements, with particular emphasis on the last 6 years, together with an indication of the dates of obtaining (scientific publications/artistic achievements, patents and protection rights, completed research projects, national/international awards for scientific/artistic achievements), with particular emphasis on achievements related to the field of study and the classes conducted in it. | |
| 1) 2021 – **winner of the First Scientific Award of the Mayor of the City of Bydgoszcz in the field of humanities, social sciences and arts**.<br>2) 2022 – **member of the Chapter of Awards and Scholarships of the Mayor of the City of Bydgoszcz**.<br>3) 2019 – award/distinction **for the first implementation of blockchain technology in Poland in a public secrecy** – by the Shared Services Center in Toruń – SmartCity Warsaw conference<br>4) Co-author of the book: "The Role of Cities in International Relations. : The Third-generation of Multi-level Governance?", Northampton, MA : Edward Elgar Publishing, 2022 - **publication for 300 points according to the list of the Ministry of Education and Science**.<br>5) Author of the book: Local Government Shared Services Centers: Management and Organization, in: "Emerald Publishing Limited" London, 2020, **publication for 120 points according to the list of the Ministry of Education and Science**<br>6) Co-author of the publication: Reaction to the Russian aggression against Ukraine: cities as international standards' supporters, in: "Journal of Contemporary European Studies", 2022, publication: **Impact Factor: 1.208, 100 points according to the list of the Ministry of Education and Science**.<br>7) Co-author of the publication: Independent players or shadow compatriots. How did British cities deal with the Brexit process?, in: "European Planning Studies", 2020, publication: **Impact Factor: 3.269, 100 points according to the list of the Ministry of Education and Science**.<br>8) Co-author of the book: Local government shared service centers. Assumptions and Practice, Warsaw, C.H. Beck Publishing House, 2018, **120 points according to the list of** | |

**the Ministry of Education and Science**.

9) Co-author of the publication: Blockchain Technology in Life Cycle Assessment – New Research Trends, in: "Energies", 2021, **Impact Factor: 3.252, 140 points according to the list of the Ministry of Education and Science.**
10) Co-author of the publication: Urban Energy Management-A Systematic Literature Review, in: "Energies", 2022, **Impact Factor: 3.252, 140 points according to the list of the Ministry of Education and Science.**

Characteristics of the experience and didactic achievements (up to 600 characters) and a list **of at least 10** most important teaching achievements, with particular emphasis on the last 6 years, together with an indication of the dates of obtaining (e.g. authorship of textbooks/teaching materials, implemented didactic innovations, awards obtained by students over whom the academic teacher supervised scientifically/artistically, supervision of the Diamond Grant beneficiary, launch of a new one). field of study/specialisation/classes/group of classes, supervision of a research club, conducting classes in a foreign language, including at a foreign university, e.g. as part of the mobility of academic teachers).

- Conducting classes for students of the Faculty of Management, in the fields of Finance and Accounting, Management and Management and Production Engineering in the following subjects: Financial Accounting, Basics of Accounting, Corporate Finance, Corporate Finance Management, Cost Accounting, Internal Audit.
- Conducting classes for students of the Faculty of Civil Engineering, Architecture and Environmental Engineering in the subject: Basics of finance, banking and accounting.
- Supervisor of several dozen bachelor's and master's theses.
- 5th place in the competition for the best academic teacher in the Kuyavian-Pomeranian Voivodeship

Description of professional experience in connection with the learning objectives and learning outcomes assumed at the Doctoral School.

Many years of practical experience in creating shared service centers in Poland and auditing these units. Many years of experience in managing large entities and implementing large investment and research projects.

Training

Numerous trainings in the field of finance, accounting, management and project implementation

International scientific activity:

**Projects**

2021-2023 – Participant of the research team implementing the OPUS research grant from the National Science Centre.

**Conferences**

1. 24th Cities on the Internet Conference: "DIGITAL TRANSFORMATION OF LOCAL GOVERNMENTS - a generator of development, a source of savings, a technological breakthrough of the COVID-19 pandemic", November 2020.
2. VII National Conference "Competitiveness and development of regions in the conditions of European integration and globalization. Status – Trends – Strategies", Conditions and potential of distance learning in student education, Faculty of Management UTP in

Bydgoszcz, Faculty of Organization and Management, Silesian University of Technology, November 2020.

3. GOVTECH – Blockchain in the public sector, May 2019, Warsaw, title of the speech: "The use of blockchain technology in optimizing the efficiency and security of processes of local government shared service centers"
4. Congress – Management of local government administration, April 2019, Wrocław, Title of the speech: "Shared Service Centers in Poland. Presentation of research results"
5. Conference – Competitiveness and development of regions in the conditions of European integration and globalization. Stan-Trends-Strategies, November 2019, Institute of Management, Administration and Logistics, Faculty of Organization and Management, Silesian University of Technology, title of the speech: "New concepts of public management – standardization of processes in shared service centers"
6. PUBSIC Conference 2019 Innovation in Public Services and Public Policy, Bocconi University, Milan, Italy, January 2019, title of the presentation: "Innovative ICT in public services. Technology of durable media implemented in Polish Shared Services Centres – a case study"
7. Implementing Collaborative Governance Conference 2018, University of Palermo, Palermo, Italy, October 2018, title: The process of organisation and implementation of local government Shared Services Centers – a case study of the City of Toruń"
8. 85th International Atlantic Economic Conference, International Atlantic Economic Society, March 2018, London, Title of the presentation: "Process management in local government SSC design of SLA contracts"
9. International Risk Management Conference 2017, University of Florence, Florence, June 2017, title: "Service Level Agreements as a primary tool of risk management in financial accounting processes in government shared services centers in Poland"
10. International Conference of Banking and Finance [ICBF], Faculty of Management, University of Warsaw, July, 2017, title: "Finance management in local government shared services centres in Poland – primary experiences"
11. 2nd International Scientific Conference "Positive management and leadership in socially responsible organisations", Faculty of Economic Sciences and Management, Nicolaus Copernicus University, September 2017, title of the presentation: "Shared services centres in the public and private sectors – the case study of Great Britain"

**Scholarships and internships**

1. Politecnico di Bari, Department of Mechanics, Mathematics and Management – May 2022
2. Adana Alparslan Turkes Science and Technology University (Turkey), January 2022.
3. Politecnico di Bari, Department of Mechanics, Mathematics and Management – October 2019
4. Cordoba University, Faculty of Law and Business Sciences – April 2018

**Characteristics of academic teachers and other persons conducting classes at the Doctoral School of the Bydgoszcz University of Technology**

| Name: | **Arkadiusz Januszewski** |
|---|---|

Academic title/field, academic degree/field and discipline, professional title (in the case of the professional title of doctor – specialization), year of obtaining the academic title/degree/professional title:

Ph.D./Economics/Management and Quality Sciences, 2012

List of classes conducted with doctoral students at the Doctoral School of the Silesian University of Technology.

- Resource and process cost accounting

Supervisor's care.

-

Characteristics of scientific achievements, indicating the fields of science/art and the discipline/discipline(s) of science/arts in which the achievements fall (up to 600 characters) and a list **of at least 10** most important scientific/artistic achievements, with particular emphasis on the last 6 years, together with an indication of the dates of obtaining (scientific publications/artistic achievements, patents and protection rights, completed research projects, national/international awards for scientific/artistic achievements), with particular emphasis on achievements related to the field of study and the classes conducted in it.

His interests and scientific achievements are related to the discipline of management and quality science. Main areas of scientific research:

- computer-aided controlling and management accounting systems, in particular computer-aided resource-process cost accounting systems
- Functionality and applications of IT management systems
- methods of education in management and accounting and IT competences of accountants
- modern information technologies used in sustainable development
- Digital transformation of financial and accounting processes

List of scientific achievements:

Preparation of the review of the doctoral dissertation:

1. Tomasz Zieliński, "Resource and process cost accounting in the enterprise", supervisor: Cezary Kochalski, PhD, DSc; Poznań University of Economics and Business, 2014

Scientific publications

2. Januszewski A, Cloud-based Accounting Information Systems. Insights from Poland. AMCIS2023 Proceedings (in press)
3. Januszewski, A., & Buchalska-Sugajska, N. (2022). Online Managerial Accounting education during the COVID-19 pandemic: A case study from Poland. Procedia Computer Science, 207, 215-226.
4. Januszewski, A., & Grzeszczak, M. (2021). Internship of Accounting Students in the Form of E-Learning: Insights from Poland. Education Sciences, 11(8), 447.
5. Januszewski, A., & Krupcała, K. (2021, September). Experience from Attempts to Implement an e-CRM System in an e-Commerce Micro Enterprise. In PLAIS EuroSymposium on Digital Transformation (pp. 37-50). Springer, Cham.

6. Januszewski, A., & Kujawski, J. (2021). Best Practices in Robotic Process Automation in Global Business Services. AMCIS2021 Proceedings.
7. A. Januszewski, Integration of case study approach, project design and computer modeling in managerial accounting education with a diploma thesis development as an example, International Journal of Advanced Trends in Computer Science and Engineering, 2019, Vol. 8, No. 1.1. pp.54-59.
8. A. Januszewski, Designing of an Activity-Based Information System as a Part of Management Accountants Education, International Scientific Conference Proceedings of Knowledge for Market Use 2018, Palacky University Olomouc 2018, pp. 134-140.
9. Januszewski A., 2008, *Activity-Based Costing System for a Small Manufacturing Company – a Case Study*. [in:] Encyclopedia of Decision Making and Decision Support Technologies (ed. Adam F., Humphreys P.) Publisher: Information Science Reference, IGI Global, USA, ISBN: 978-1-59904-843
10. Januszewski A., *The Method of Appraising Needs and Possibilities of Activity-Based Costing Implementation*. [in:] Encyclopedia of Decision Making and Decision Support Technologies (ed. Adam F., Humphreys P.) Publisher: Information Science Reference, IGI Global USA, ISBN: 978-1-59904-843

Characteristics of the experience and didactic achievements (up to 600 characters) and a list **of at least 10** most important teaching achievements, with particular emphasis on the last 6 years, together with an indication of the dates of obtaining (e.g. authorship of textbooks/teaching materials, implemented didactic innovations, awards obtained by students over whom the academic teacher supervised scientifically/artistically, supervision of the Diamond Grant beneficiary, launch of a new one). field of study/specialisation/classes/group of classes, supervision of a research club, conducting classes in a foreign language, including at a foreign university, e.g. as part of the mobility of academic teachers).

His experience and didactic achievements are related to conducting classes in the field of management accounting, controlling, cost accounting, management IT systems, including accounting IT systems, and a seminar with bachelor's, engineer's and master's students. Supervisor of over 200 bachelor's, engineer's and master's theses at the University of Technology and Life Sciences in Bydgoszcz, the University of Management and Finance in Bydgoszcz and the University of Information Technology in Łódź (Branch in Bydgoszcz) and with participants of trainings/courses carried out for employees in enterprises and institutions.

List of the most important teaching achievements:

1. Awards for students for diploma theses
    - 2013 – I place for the best diploma thesis for Anna Wesołowska in the competition of the Polish Society for Production Management, Branch in Bydgoszcz (master's thesis entitled "Computer model of activity cost accounting for a company from the foundry industry")
    - 2014 – distinction for the diploma thesis for Łukasz Krzemiński in the competition of the Polish Society for Production Management, Branch in Bydgoszcz (master's thesis entitled "Application of an integrated IT system in logistics processes on the example of BELMA SA")
    - 2016 – distinction for the diploma thesis for Łukasz Krzemiński in the competition of the Polish Society for Production Management, Branch in Bydgoszcz (master's thesis "Model of activity cost accounting for a company from the plastics processing industry")
    - 2017 – 3rd place in the group of bachelor's theses in the **XX Edition of the National Scientific Competition of the Society of Economic Informatics for the** best diploma theses in the field of economic informatics for Ewelina Górecka

(thesis entitled "Construction of a computer model of activity cost accounting for broccoli production")
- 2017 – distinction for the diploma thesis for Natalia Szczepańska in the competition of the Polish Society for Production Management, Branch in Bydgoszcz (master's thesis entitled "The process of optimization of finished product inventories")
- 2017 - distinction for the diploma thesis for Natalia Mackiewicz in the competition of the Polish Society for Production Management, Branch in Bydgoszcz (bachelor's thesis entitled "*Assessment of the profitability of production and distribution of concrete in a production enterprise using activity cost accounting")*
- 2018 - distinction for Jakub Nowacki for his diploma thesis in the competition of the Polish Society for Production Management, Bydgoszcz Branch (master's thesis entitled "Improving the production process on the example of a selected company")

2. Preparation and delivery of original lectures at seminars in India:
   - February 19, 2018 – lecture for MBA students entitled "The Role of IT in Teaching Management Students" at a seminar organized by C.K. Shah Vijapurvala Institute of Management (Vadodara);
   - February 23, 2018 – lecture for students entitled "Research in the Computer Laboratory of Controlling and Managerial Accounting Systems at UTP University" at a seminar organized by the SAL Institute of Management (Ahmedabad);
   - February 23, 2018 - presentation of a lecture entitled "The Role of IT in Teaching Management Students" at a seminar organized by the Faculty of Management, Gujarat Forensic Sciences University (Gandhinagar);
   - February 24, 2018 - Giving a lecture to students on "IT skills and Analytical skills in Activity Based Costing models development" at a seminar organized by the Shri Jairambhai Institute of Business Management & Computer Applications, National Institute of Cooperative Management Group of Institutions, (Gandhinagar).
   - Development and conducting of original classes in the subjects "Activity-based Management" and "Management Accounting" for students of the ERASMUS/ERASMUS+ program (since 2014)
3. Cooperation in the launch of new fields of study and specializations (cooperation in the development of concepts, preparation of applications, development of syllabi)
   - Bachelor's degree in Finance and Accounting at the Faculty of Management of UTP (2014-2015)
   - new specialization "Accounting for a manager" at the second-cycle studies in management at the Faculty of Management of UTP (2017-2018)
   - II-degree in the field of "Finance and Accounting", responsibility for the preparation of the specialization "Business Analytics in Accounting and Controlling" (2019)

Description of professional experience in connection with the learning objectives and learning outcomes assumed at the Doctoral School.

- 2014 – 2015 – development of the "Methodology for the implementation of operational controlling instruments in small and medium-sized commercial and service enterprises" as part of the "Temporary Employment of Highly Qualified Personnel" – the project "Region Open to Innovation", financed from the Human Capital Operational Programme

- 2009 – development of a multi-stage income statement application based on a spreadsheet for the District Dairy Cooperative in Łobżenica
- 2006 – audit of the cost accounting system in BZE BELMA in Bydgoszcz and development of the concept of a computer-aided system of activity cost accounting
- 2002 – 2004 – principal investigator of the research grant "Diagnosis of needs, possibilities and limitations in the application of Activity Based Costing in the management of domestic enterprises" (project no. 2H02D 060 23)
- 1999 (September) - 2000 (July) – Plenipotentiary of the President of the Management Board for Controlling in the Municipal Heat Energy Company in Bydgoszcz

Training

**Development and delivery of training**

- 2005-2008 – member of the team developing the Ms-Office training, trainer of modules in Ms-Excel as part of the EQUAL project – "Get up, raise your head" (Community Initiative Program – EQAUL A0518,
- 2007 – 2011 – development of educational programs in a computer laboratory in the field of advanced use of the Ms-Excel spreadsheet used in business management (laboratory classes as part of the subjects "Management Accounting", "Cost Accounting", "Applications of IT in Commercial Enterprises", "Operational Controlling in Commercial Enterprises" at the Faculty of Management of the University of Technology and Life Sciences in Bydgoszcz,
- since 2007 – development and conducting lectures combined with a computer laboratory in Ms-Excel on cost accounting design (ABC) and IT controlling systems at postgraduate studies "Management Accounting and Controlling – Modern systems based on information technology", Faculty of Management AGH in Krakow,
- 2008 – development of a three-stage training cycle (3x2 training days) in the field of advanced spreadsheet use (training "Ms-Excel in cost and profitability management" for the Manager's Academy in Poznań),
- 2010 – development of the program of postgraduate studies "Controlling and Management Accounting in Practice" with the use of Ms-Excel at the University of Technology and Life Sciences in Bydgoszcz,
- 2010 – 2014 – development and lecture on "The role of Business Performance Management in IT projects" at the postgraduate studies "IT project management", Faculty of Management, University of Warsaw,
- 2011 - development and conducting of three training modules in the field of advanced use of spreadsheets used in management (training "Excel in management" as part of the project "New knowledge – new competences" POKL.08.01.01-04-126/09),
- since 2012 – development and conducting a lecture combined with a computer laboratory on "Management Accounting" at EMBA studies at the University of Gdańsk,
- 2012 – development of a training in the field of advanced use of a spreadsheet used in multidimensional analysis (training "Multidimensional sales and profitability analysis in Ms-Excel" developed for the Manager's Academy in Poznań)
- 2012 – development of a scenario of a 182-hour e-learning training "Excel in SME management" as part of the "Innovative project E-learning for the blind and visually

impaired – Now@ perspective", co-financed by the European Union under the European Social Fund" commissioned by the WIDZIALNI Foundation based in Częstochowa

- 2012-2013 - development and conducting training in "Planning the management information system" (2 days of 8 hours for 4 groups) and "Designing the controlling system in the enterprise" with the use of a spreadsheet as part of the e-controlling Academy project intended for the management and employees of enterprises from the Małopolska Region (2 days of 8 hours for 6 groups) commissioned by YesLogo Spółka z o.o.
- 2014 – development and conducting training (4 days of 8 hours for 4 groups) in management accounting and controlling with the use of MS-Excel spreadsheet for the management staff of the Kazimierz Wielki University in Bydgoszcz implemented as part of the project "Development Program of the Kazimierz Wielki University in Bydgoszcz" (POKL.04.01.01-00-157) financed by the EU.
- since 2016 - lectures on Advanced Management Accounting at accredited studies in ACCA Accounting, Faculty of Management, University of Gdańsk
- 2017 – development and conducting of a dedicated training in Management Accounting (2 days of 8 hours each) for the management staff of Przedsiębiorstwo Uzdrowisko Ciechocinek S.A.

**Participation in trainings**

- 2008 – "*ABC/M Explorer Modeling Basic"* training organized by ABC Akademia, which deals with the implementation of IT systems for the cost of activities (obtained title – *ABC/M Explorer Certified Consultant – Basic Level*),
- 2009 – training of *the Controlling Systems* company, devoted to the EURECA system supporting operational controlling,
- 2010 – SAS Institute Summer School, dedicated to *Business Intelligence systems,*
- 2010 – training on electronic signature (certificate No. E/18/2), organized as part of the Human Capital project "Man – the best investment",
- 2012 – training in the use of the PROPHIX budgeting and analysis system,
- 2012 – training in the use of *the Result Scorecard system* , supporting the management of the organization's strategy,
- 2012 – training in the use of the Profit *Management System*.

International scientific activity:

Projects

Conferences

In the years 2003-2022, he presented papers at the following international scientific conferences and seminars: KES 2022, Verona, Italy, AMCIS 2021, Montreal, Canada; AMCIS 2020, Salt Like City, USA, KES 2021, Szczecin, Poland, Eurosymposium 2021, Gdańsk, Poland, International Scientific Conference Proceedings of Knowledge for Market Use, Palacky University Olomouc 2018; 5th International Conference on Governance in Indian Financial Services Sector: Reforms & Remedies, Ahmedabad, India, 2018; ISTD Regional Conference on Transcending Sustainability: The Bottom Line" Vadodara, India, 2018; Journal of Arts & Sciences (IJAS) conference, Montreal, 2018; 10th annual International Conference of Education, Research and Innovation, Seville, 2017; 10th International Technology, Education and Development Conference, Valencia, 2016;

7th International Conference on Education and New Learning Technologies, Barcelona, 2015, International Conference on E-Business, Enterprise Information Systems, E-Government and Outsourcing, Las Vegas, 2011, USA; Journal of Arts & Sciences (IJAS), Toronto, 2009; Information Systems Development, Budapest, 2006; International Conference on E-Business, Enterprise Information Systems, E-Government and Outsourcing Las Vegas, 2005; Business Information Systems, Colorado Springs, USA, 2003,

Organizing and conducting the scientific session "IT and IS for Accounting, Finance and Controlling" at the International Conference on Knowledge-Based and Intelligent Information & Engineering Systems in Verona, Italy (KES 2022) and in Athens, Greece (KES 2023).

Scholarships and internships

**Characteristics of academic teachers and other persons conducting classes at the Doctoral School of the Bydgoszcz University of Technology**

| Name: | **Urszula Słupska** |
|---|---|
| Academic title/field, academic degree/field and discipline, professional title (in the case of the professional title of doctor – specialization), year of obtaining the academic title/degree/professional title: | |
| Doctor of Economics, in the discipline of management sciences (2012). | |
| List of classes conducted with doctoral students at the Doctoral School of the Silesian University of Technology. | |
| Business Relationship Management | |
| Supervisor's care. | |
| | |
| Characteristics of scientific achievements, indicating the fields of science/art and the discipline/discipline(s) of science/arts in which the achievements fall (up to 600 characters) and a list **of at least 10** most important scientific/artistic achievements, with particular emphasis on the last 6 years, together with an indication of the dates of obtaining (scientific publications/artistic achievements, patents and protection rights, completed research projects, national/international awards for scientific/artistic achievements), with particular emphasis on achievements related to the field of study and the classes conducted in it. | |
| Scientific achievements in the discipline of management and quality sciences:<br><br>Master's degree in Management and Marketing (Development Process Management), in the group of 5% of the best graduates of the Nicolaus Copernicus University (2006). Postgraduate studies in Pedagogical Preparation (2008). Doctor of Economics, in the discipline of management science, with distinction for his doctoral dissertation (2012). Participation in 11 projects. Expert for the substantive financial and economic evaluation of applications for ERDF funding at the Municipal Office of the Province of the Province of Land and Culture (2014-2017). Author of 33 scientific publications in the field of management. Scientific and research topics: virtualization of economic activity, cooperation of enterprises and relational capital.<br><br>Selected publications:<br>1. Urszula Słupska, Zbigniew Drewniak, Rafał Drewniak, Robert Karaszewski, *Building Relations between the Company and Employees: The Moderating Role of Leadership*, "Sustainability", 2022, 14.<br>2. Urszula Słupska, Zbigniew Drewniak, Robert Karaszewski*, Improving the Internal Relations Versus Shaping the External Relations of the Enterprise*, "European Research Studies Journal", 2020, Volume XXIII, Special Issue 1, p. 572-585<br>3. Robert Karaszewski, Iwona Posadzińska, Rafał Drewniak, Zbigniew Drewniak, Urszula Słupska, *Relational Capital in Business*, University Publishing House, Bydgoszcz, 2020.<br>4. Rafał Drewniak, Urszula Słupska, Iwona Posadzińska, *Leadership and Internal Relational Capital of Enterprises*, "European Research Studies Journal", 2020, Volume XXIII, Special Issue 1, pp. 373-388.<br>5. Zbigniew Drewniak, Urszula Słupska, Agnieszka Goździewska-Nowicka, Succession and Ownership in Family Businesses, "European Research Studies Journal", 2020, Volume XXIII, Issue 4, p. 638–654<br>6. Iwona Posadzińska, Urszula Słupska, Robert Karaszewski, *The Attitudes and Actions of the Superior and the Participative Management Style*, "European Research Studies Journal", 2020, Volume XXIII, Special Issue 1, pp. 488-501. | |

7. Agnieszka Goździewska-Nowicka, Tomasz Janicki, Wojciech Popławski, Barbara Bielicka, Urszula Słupska, *Process Management as a Challenge for Contemporary Organizations*, in: R. Tylżanowski (ed.), *Innovation Management in the Enterprise. Research News,* TNOiK Toruń, 2020, pp. 39-50.
8. Urszula Słupska, Iwona Posadzińska, Robert Karaszewski, *Knowledge Management and Internal Relational Capital versus Development of Relations with Environment*, [in:] Mesquita Anabela, Silva Paulino (eds.), *Proceedings of the 15th European Conference on Management, Leadership and Governance,* ECMLG 2019, Porto, Portugal, pp. 349-356
9. Urszula Słupska, *The importance of knowledge in building relational competences in virtual organizations,* [in:] A.P. Balcerzak, I. Pietryka (eds.), *Proceedings of the 10th International Conference on Applied Ecominics: Entrepreneurship and Management*, Olsztyn : Institute of Economic Research, Toruń 2019, pp. 161-170.

Selected projects:

1. 2018-2020 Cooperation in the implementation of the scientific project (member of the research team) NCN Opus 13 "Relational competences in creating enterprise value. The role of leadership and communication in relations with the environment", WZ UTP in Bydgoszcz, head of the research team: prof. dr hab. R. Karaszewski, associate professor at the University of Silesia

Characteristics of the experience and didactic achievements (up to 600 characters) and a list **of at least 10** most important teaching achievements, with particular emphasis on the last 6 years, together with an indication of the dates of obtaining (e.g. authorship of textbooks/teaching materials, implemented didactic innovations, awards obtained by students over whom the academic teacher supervised scientifically/artistically, supervision of the Diamond Grant beneficiary, launch of a new one). field of study/specialisation/classes/group of classes, supervision of a research club, conducting classes in a foreign language, including at a foreign university, e.g. as part of the mobility of academic teachers).

Postgraduate studies in Pedagogical Preparation (2008). 14 years of experience in teaching. Supervisor and reviewer of 42 diploma theses. She has taught over 40 subjects in the field of management and quality sciences, m.in.: Quality Management, Management, Management Concepts, Fundamentals of Management, Strategic Management, Basics of Running a Business, Virtualization of Economic Activity, Human Resource Management, Negotiations in Business, Psychology of Manager's Work. Coordinator of events as part of the Global Entrepreneurship Week at the WZ PBŚ.

Selected teaching projects:

1. 2023 Cooperation in the launch of the first cycle of studies in Sports Management at the Faculty of Management of the Silesian University of Technology (development of syllabi)
2. 2020-2021 Cooperation in the implementation of the NCBiR project POWR.03.01.00-IP.08-00-MOC/18 "Course for MOOC" (member of the management team and member of the executive team); "University as a creator of SME human resources", project leader: dr hab. I. Posadzińska, prof. PBŚ
3. Since 2018, cooperation with the Bydgoszcz Regional Development Agency in the field of organizing and coordinating events carried out at the WZ PBŚ as part of the "Global Entrepreneurship Week"
4. 2019 Cooperation in the launch of the second cycle of studies in Finance and Accounting at the Faculty of Management of UTP (cooperation in developing the concept, preparing the application, developing syllabi)
5. 2017 Implementation of a research project carried out with students of undergraduate and second-cycle studies, part-time studies, in the field of Economics, concerning "Virtual enterprises", leader of the research team: dr Urszula Słupska

Description of professional experience in connection with the learning objectives and learning outcomes assumed at the Doctoral School.

Experience in teaching in higher education, both at the level of first-, second-cycle and postgraduate studies. He has methodological experience. He conducts scientific research in the field of cooperation of enterprises, formation of relational capital, virtualization of business

activity and virtual relationships. He cooperates with business environment institutions. Since 2020, he has been a member of the Working Group on University Social Responsibility chaired by Prof. Piotr Wachowiak, Rector of the Warsaw School of Economics and under the patronage of the Ministry of Development Funds and Regional Policy. Since January 2021, he has been a supervisor and mentor from the University of the TOP YOUNG 100 Program (an initiative addressed to the best students of faculties related to supply chain, management and production engineering, economic analytics, business analysis and management, automation and robotics in Poland). Since October 2021, he has been a member of the Committee for the Strategy of the Scientific Discipline. Since December 2022, she has been the Chairwoman of the Discipline Council of Management and Quality Sciences.

Training

2022 – Training "Don't give in to cyber robbers" – online training, SECURITUM IT systems security
2021 - Training "Closing a project – the most important information on how to prepare a final application and settle the project"; National Centre for Research and Development, Warsaw.
2020 - Workshops: "How to create a MOOC?"; Young Science Foundation, Warsaw
2019 - Workshops for beginner POWER Beneficiaries; National Centre for Research and Development, Warsaw
2017 - Implementation of a training program for academic teachers as part of Erasmus+ Staff Mobility, Kazimieras Simonavicius University, Vilnius.
2017 - Training "Strategic partnerships in the higher education sector. How to prepare a project well in the 2017 competition?" Erasmus + Academy, Warsaw.

International scientific activity:

Conferences:

1. 4th American University in the Emirates International Research Conference (AUEIRC'22), 22-24.05.2022, Dubai; on-line conference
2. Prioritized Business: Thriving through COVID-19; Five Capitals, 15.07.2020 on-line webinar
3. Why Relational Capital is the New Focus in Business; Five Capitals, 09.07.2020 on-line webinar
4. 10th International Conference on Applied Economics Contemporary Issues in Economy; Nicolaus Copernicus University in Toruń, 27-28 June 2019; Torun
5. 15th European Conference on Management Leadership and Governance (ECMLG19); Polytechnic Institute of Porto, Portugal on 14th-15th November 2019

**Characteristics of academic teachers and other persons conducting classes at the Doctoral School of the Bydgoszcz University of Technology**

| *Name:* | **Bogdan Lent** |
|---|---|

*Academic title/field, academic degree/field and discipline, professional title (in the case of the professional title of doctor – specialization), year of obtaining the academic title/degree/professional title:*

Dr.-Ing University of Hagen (Germany), engineering and technical sciences, technical informatics and telecommunications, 1995

Doctor of Czestochowa University of Technology in economic sciences, discipline management, 2016

*List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology.*

Conducting innovative projects

*Supervisor's care*

Scope:

1. Study of motivation factors for involvement in a project in Poland
2. The role and determinants of emotional involvement in project management
3. Modeling the required skills and their determinants in mastering the complexity of project implementation.
4. Innovative personality in conducting innovative projects
5. Analysis of the effectiveness of the organization of project implementation according to various organizational methods

*Characteristics of scientific achievements, indicating the fields of science/art and the discipline/discipline(s) of science/arts in which the achievements fall (up to 600 characters) and a list* ***of at least 10*** *most important scientific/artistic achievements, with particular emphasis on the last 6 years, together with an indication of the dates of obtaining (scientific publications/artistic achievements, patents and protection rights, completed research projects, national/international awards for scientific/artistic achievements), with particular emphasis on achievements related to the field of study and the classes conducted in it.*

2023 B. Lent, Ch. Zhang, Economic and Business Management 2022, Proceedings of the 7th International Conference on Economic and Business Management (FEBM 2022), Taylor&Francis CRC Press

2023 B. Lent, Employees Conduct vs Private Interests: Prosecution vs Values, in B. Lent, Ch. Zhang, Economic and Business Management 2022, Proceedings of the 7th International Conference on Economic and Business Management (FEBM 2022), Taylor&Francis CRC Press

2019 B. Lent, Proceedings of the Fourth International Conference on Economic and Business Management (FEBM 2019), Atlantis Press

2013 B. Lent, Cybernetic Approach to Project Management, Springer

Weitere Publikationen: www.bogdan.lent.ch

*Characteristics of the experience and didactic achievements (up to 600 characters) and a list **of at least 10** most important teaching achievements, with particular emphasis on the last 6 years, together with an indication of the dates of obtaining (e.g. authorship of textbooks/teaching materials, implemented didactic innovations, awards obtained by students over whom the academic teacher supervised scientifically/artistically, supervision of the Diamond Grant beneficiary, launch of a new one). field of study/specialisation/classes/group of classes, supervision of a research club, conducting classes in a foreign language, including at a foreign university, e.g. as part of the mobility of academic teachers).*

* Government and scientific projects of Switzerland and Thailand, consultant to the Chancellery of the Prime Minister, previously the Minister of Digitization of Polish, Consultant to the Ministry of Digital Economy and Ministry of Transport of Thailand.

* B. Lent, 2013, Cybernetic Approach to Project Management, Springer, materials didactic. in English and German.

* 2nd place in the country in the IPMA master's thesis competition, prov. B. Lent

* 2007-2011, prov. dissertation with defense at Univ. Kasetsart, Bangkok, Thailand.

* 2020-present, Pol. in Shenzhen, China.

2017-present, Pol. in Bydgoszcz. ERASMUS classes.

2008-2014, War Studies Academy in Warsaw. ERASMUS classes.

2005-present, Univ. Applied Sciences in Bern, Switzerland.

2005-2016, Univ. Kasetsart, Bangkok, Thailand.

*Description of professional experience in connection with the learning objectives and learning outcomes assumed at the Doctoral School.*

er at the Swiss Ministry of Foreign Affairs – equipping Swiss embassies with a new local telecommunications system.

2022-2023, Project Head of the new generation of foreigner management system in Switzerland, Ministry of Justice of Switzerland.

2020-present, Visiting Professor at Shenzhen University of Technology, China. Classes on the cybernetic approach to project management.

2020-2021, Head of Projects at the Canton Tax Authority of Bern, Switzerland; digitization of tax processes, new accounting system (10 million transactions, CHF 10 billion per year).

2020-present Consultant of risks and project methods at the Chancellery of the Prime Minister, Warsaw.

2018-2019 Project manager at the Office of Environmental Protection of the implementation of a new government process management system and document repository.

2016- present Professor at the University of Technology and Life Sciences in Bydgoszcz, Faculty of Management, didactic and scientific work, subjects: innovation, decision-making processes, project management.

2016-2020 Consultant of risks and project methods Ministry of Digital Affairs WWA

2016-2017 Member of the risk analysis team for the project of the new IT infrastructure of the Swiss government.

2015-2016 Head of the project for biometric documents of foreigners in Switzerland

2015-2018 Advisor and Project Conduct Trainer at the Ministry of Transport of the Government of Thailand

2014-2015 Project leader and project evaluation expert of the Swiss General Roads and Motorway Administration

2013-2014 Vice-president OEM of Bernina International AG, Switzerland. International cooperation project (Japan, Vietnam) in the production of new products.

Previous professional work – see www.bogdan.lent.ch m.in.

2005–present Associate Professor at the University of Applied Sciences in Bern, didactic and research work, topic: project management

2005-2016 Visiting Professor at Kasetsart University, Bangkok, didactic and research work, subject: project management

2004-2014 Professor at the University of Technology and Life Sciences in Bydgoszcz, didactic and scientific work, subject: project management

*Training*

2021 Safety Certificate of the Canton of Bern

2020 Recertification of the Swiss Government Project Method HERMES

2018 All ActaNova Process Management System and Document Repository Training Courses

2016 ITIL Foundations Certificate

2010-2019 Certificate of continuous education of teaching staff of the Univ. Applied Sciences in Bern

2011 CMMI Certified

1987-1994 Research project, opening of doctoral dissertation (courses and admission exams) at the Technical University of Zurich (ETHZ)

*International scientific activity:*

2018-2022 AGRICORE Project (H2020)

2010-2012 Innovator of the War Studies Academy and Univ. Applied Sciences in Bern

2008-2012 Study of motivation factors in the Uniw. Applied Sciences in Bern and the Military Academy in Zurich

2007-2011 Conducting a dissertation with defense at Univ. Kasetsart, Bangkok, Thailand

1987-1994 Research project of industrial automation architecture at the Technical University of Zurich (ETHZ)

*Projects*

In Poland, Switzerland, Germany, Austria, Thailand, Vietnam and Japan (see above and on www.bogdan.lent.ch)

*Conferences*

* Chairman and co-editor (Francis & Taylor):

2022: 7th International Conference on Economic and Business Management (FEBM 2022), China

* Chairman and editor (Atlantis Press):

2019: 4th International Conference on Economic and Business Management (FEBM 2022), China

* Member of the Organizing and Scientific Committees:

1978-2023 approx. 50 scientific conferences in Świecie

*Keynote:

2018: ICT Management for Global Competitiveness and Economic Growth in Emerging Economies

2015: ICT Management for Global Competitiveness and Economic Growth in Emerging Economies, Poland

2014 Enterprise Architecture for e-Government, Ministry of Security and Public Administration of Korea.

2006 International Conference of the Chinese Information Technology Association in Chongqing, China

* Participant, speaker:

1978 -1999: Euromicro Conferences (2 per year)

2003-2023: HERMES Swiss Government Project Method Conferences

1978 – 2023: Ca. 20 different international conferences

*Scholarships and internships*

No. Regular professional work abroad.

27.05.2023/Lent

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# CRITERION 3

# Qualifications of academic teachers or research staff conducting education at the doctoral school

## chemical sciences

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Przemysław Kosobucki, PhD, DSc, Associate Professor

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

- 1998 MSc, Faculty of Chemistry, Nicolaus Copernicus University, exact and natural sciences, discipline: c
- 2003 Ph.D., Faculty of Chemistry, Nicolaus Copernicus University, exact and natural sciences, discipline: chemical sciences
- 2014 Ph.D., Faculty of Chemistry, Nicolaus Copernicus University, exact and natural sciences, discipline: chemical sciences

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

1. Modern combined techniques in analytical chemistry

**List of functions of supervisor or assistant supervisor of doctoral dissertations:**

1. Piotr Ścigalski (since 2020), Doctoral School of the J. and J. Śniadecki Bydgoszcz University of Technology (discipline: chemical sciences), "New sorption materials for the isolation of organic and inorganic xenobiotics from environmental matrices",
2. Sanling Zuo (since 2020), Academia Copernicana UMK, "Exploring metabolic signatures of probiotic and prebiotic functions in the intestine cells model".

**List of reviews in the procedure for scientific promotion:**

1. 2022 Sylwia Kowalska, PhD, Nicolaus Copernicus University in Toruń, "New procedures for the isotachophoretic determination of tryptophan, glutamic acid and vitamins B1, B6, B9 in food",
2. 2024 Piotr Maćczak, PhD, Nicolaus Copernicus University in Toruń, "The use of chitosan- and starch-based flocculants for the purification of process water from rinsing filters used in the groundwater treatment process"

**List of scientific publications:**

1. Deja-Sikora E., Gołębiewski M., Kalwasińska A., Krawiec A., Kosobucki P., Walczak M., Comamonadaceae OTU as a remnant of an ancien microbial community in sulfidic waters, Microbial Ecology 78 (2019) 85 - 101,
2. Kalwasińska A., Deja-Sikora E., Szabo A., Felfoldi T., Kosobucki P., Świontek-Brzezińska M., Walczak M.: Salino-alkaline lime of antropogenic origin a reservoir of diverse microbial communites, Science Total Environment 655 (2019) 842-854,
3. Ścigalski P., Kosobucki P., Recent Materials Developed for Dispersive, Solid Phase Extraction, Molecules (2020), 25, 4869; DOI: 10.3390/molecules25214869,
4. Tatarchuk T., Naushad M., Tomaszewska J., Kosobucki P., Myslin M., Vasylyeva H., Ścigalski P., Adsorption of Sr(II) ions and salicylic acid onto magnetic magnesium-zinc ferrites: isotherms

and kinetic studies, Environmental Science and Pollution Research (Springer), 2020, 27, 26681-26693; https://doi.org/10.1007/s11356-020-09043-1,
5. Kalwasińska A., Krawiec A., Deja-Sikora E., Gołębiewski M., Kosobucki P., Świontek Brzezińska M., Walczak M., Microbial Diversity in Deep-Subsurface Hot Brines of Northwest Poland: from Community Structure to Isolate Characteristics, Applied and Environmental Microbiology, 2020, 86, 10, 1-18,
6. Tatarchuk T., Myslin M., Mironyuk I., Kosobucki P., Ścigalski P., Kotsyubynsky V., Removal of Congo Red dye, polar and non-polar compounds from aqueous solution using magnesium aluminate nanoparticles, Materials Today: Proceedings (Elsevier), 2021, 35, 4, 518-522, https://doi.org/10.1016/j.matpr.2019.10.012,
7. Ścigalski P., Kosobucki P., Nanomaterials developed for the purpose of dispersion extraction to the solid phase, part 1 – modifications of classical materials, Chemical News (2022), 76, 1-2, 27-42,
8. Ścigalski P., Kosobucki P., Nanomaterials developed for the needs of dispersion extraction to the solid phase, part 2 – contemporary materials, Chemical News (2022), 76, 1-2, 43-57,
9. Kosobucki P., Studziński W., Zuo S., The role of analytical chemistry in poultry science, Physical Sciences Reviews, 2022, DOI: 10.1515/psr-2021-0126,
10. Wu M., Zuo S., Maiorano G., Kosobucki P., Stadnicka K., How to employ metabolomic analysis to research on functions of prebiotics and probiotics in poultry gut health?, Frontiers in Microbiology, 2022, 13, 1040434, 1-21,
11. Ścigalski P., Kosobucki P., Dendrimer Coated Silica as a Sorbent for Dispersive Solid-Phase Extraction of Select Non-Steroidal Anti-Inflammatory Drugs from Water, Molecules (2024), 29, 380, https://doi.org/10.3390/molecules29020380,
12. Sinèić Modrić G., Marinić J., Karleua R., Dubrović I., Kosobucki P., Broznic D., Those That Remain Caught in the "Organic Matter Trap": Sorption/Desorption Study for Levelling the Fate of Selected Neonicotinoids, International Journal of Molecular Sciences, 2024, 25, 11 (5700),
13. Kosobucki P., Study of Compost Based on Sewage Sludge and Different Structural Materials, Biomass, 2024, 4, 2, 273-285,
14. Narloch I., Wejnerowska G., Kosobucki P., Nutshell Materials as a Potential Eco-Friendly Biosorbent for the Effective Extraction of UV Filters and Parabens from Water Samples, Materials, 2024, 17, 20 (5128), 1-14.

**List of patents and protective works:**

1. Buszewski B., Kosobucki P., Studzińska S.: Method of determination of ionic liquids by ion chromatography, Patent PL 214846B1,
2. Buszewski B., Kosobucki P., Studzińska S.: Method of determination of ionic liquids by means of electromigration techniques, Patent PL 213461B1,
3. Buszewski B., Kosobucki P., Studzińska S.: Method of determination of ionic liquids by means of high-performance liquid chromatography, Patent PL 214842B1

**List of active participation in conferences:**

1. Pollok A., Gackowska A., Kosobucki P., Slags and ashes from thermal waste treatment as a substrate or product. What's next? 62nd Scientific Congress of the Polish Chemical Society in Warsaw, September 2-6, 2019,
2. Kosobucki P., Selected Summary Parameters in Ecoanalytics, 62. Scientific Congress of the Polish Chemical Society in Warsaw, September 2-6, 2019,
3. Kosobucki P., The influence of the hat processing of honey on the content 5-hydroxymethylfurfural, VI SCIENTIFIC CONFERENCE MONITORING AND ANALYSIS OF WATER. METHODS OF DETERMINATION OF IONIC SUBSTANCES, Toruń : 10-12.03.2019,
4. Pollok A., Kosobucki P., Studziński W., Ścigalski P., WAYS OF MANAGING SLAGS AND ASHES GENERATED BY THERMAL TREATMENT OF MUNICIPAL WASTE, Science has many names... Bydgoszcz : 29-30.06.2019,
5. Kalwasińska A., Krawiec A., Deja-Sikora E., Gołąbiewski M., Kosobucki P., Świontek Brzezińska M., Burkowska-But A., Walczak M., MICROBIOMES OF UNUSUAL ENVIRONMENTS - THERMAL BRINES, X National Microbiology Conference HYDROMICRO 2019: 20 years of hydromicrobiology – achievements and perspectives, Toruń : 9-11.06.2019,
6. Kosobucki ., Application of ITP/MS techniques in eco- and bioanalytics, VI Scientific Conference Water Monitoring and Analysis. Methods for the determination of ionic substances, Toruń : 10-12.03.2019,
7. Zuo S., Pietrzak E., Studziński W., Gardiner G., Lawlor P., Kosobucki P., Stadnicka K., Metabolic footprints of probiotic function in the chicken intestine, 73 rd Annual Meeting of the European Federation of Animal Science, Porto, Portugal : 5-9.09.2022,
8. Kosobucki P., Ścigalski P., Tatarchuk T., The use of spinel materials to isolate organic pollutants from waters, 65th Scientific Congress of the Chemical Society Toruń : 18-22.09.2023,
9. Kosobucki P., Studziński W., Gackowska A., Kowalska M., The influence of oxidizing agents on degradation, 65th Scientific Congress of the Chemical Society, Toruń : 18-22.09.2023,
10. Narloch I., Wejnerowska G., Ciaciuch A., Kosobucki P., Evaluation of the "greenness" of procedures for the determination of fatty acid profiles in milk samples, 65th Scientific Congress of the Chemical Society, Toruń : 18-22.09.2023,
11. Zuo S., Studziński W., Stadnicka K., Kosobucki P., Metabolic footprint of prebiotics and probiotics in Chick8E11 and Caco-2 intestinal cell lines, 74th Annual Meeting of the European Federation of Animal Science, Lyon : 26.088-01.09.2023,
12. Ścigalski P., Kosobucki P., Porous copolymer on silica support as a sorbent in the process of dispersion to the solid phase of non-steroidal anti-inflammatory drugs from water, 65th Scientific Congress of the Chemical Society, Toruń : 18-22.09.2023,
13. Ścigalski P., Kosobucki P., Characteristics and application of a porous copolymer on a silica carrier for the isolation of pharmaceuticals from water, 65th Scientific Congress of the Chemical Society, Toruń : 18-22.09.2023,
14. Ścigalski P., Kosobucki P., Gadzała-Kopciuch R., Application of dendrimic sorbent MA-BDDE in dispersion to solid state extraction of parabens and estradiol from water, 66th Congress of the Polish Chemical Society Poznań : 15-20.09.2024,

15. Kosobucki P., Piesik K., Identification of combustion products of hybrid/electric car bodies using mobile systems, 66th Congress of the Polish Chemical Society, Poznań : 15-20.09.2024.

**List of scholarships and scientific internships:**

1. Erasmus Plus, University of Cádiz, Cadiz, Spain, X 2018,
2. Erasmus Plus, Universita Degli Studi dell'Insubria, Italy, October 2019.

**List of participation in scientific grants:**

lack

**Other important academic and professional achievements:**

1. 2019-2023 Awards and distinctions of the Rector of UTP, PBŚ for scientific and organizational activities;
2. 2024 Silver Medal of the President of the Republic of Poland for long service;
3. 2024 Medal of the National Education Commission for teaching activity.

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# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Sylwia Kwiatkowska-Marks

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

In 2004, I obtained a PhD degree in technical sciences at the Faculty of Technology and Chemical Engineering of the Szczecin University of Technology. Discipline: chemical engineering.

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

1. Modern trends in the energy sector – green energy

**List of scientific publications:**

1. Trawczyńska I.; Kwiatkowska-Marks S., Biosorption of copper ions on alginate granules – steady-state process efficiency. Chemical Industry 2023, 102/12, 1364-1366. DOI: 10.15199/62.2023.12.11
2. Trawczyńska I.; Kwiatkowska-Marks S., Application of Response Surface Methodology for Optimization of the Biosorption Process from Copper-Containing Wastewater. Molecules 2023, 28, 444. DOI: 10.3390/molecules28010444
3. Radzymińska-Lenarcik E.; KWIATKOWSKA-MARKS S.; Kościuszko A. Transport of Heavy Metals Pb(II), Zn(II), and Cd(II) Ions across CTA Polymer Membranes Containing Alkyl-Triazole as Ions Carrier. Membranes 2022, 12, 1068. DOI: 10.3390/membranes12111068
4. Tatarchuk Tetiana, Shyichuk Alexander, Sojka Zbigniew, Gryboś Joanna, Naushad Mu, Kotsyubynsky Volodymyr, Kowalska Maria, Kwiatkowska-Marks Sylwia, Danyliuk Nazarii. *Green synthesis, structure, cations distribution and bonding characteristics of superparamagnetic cobalt-zinc ferrites nanoparticles for Pb(II) adsorption and magnetic hyperthermia applications.* Journal of Molecular Liquids, 2021, 328(1A), 115375, DOI: 10.1016/j.molliq.2021.115375
5. Sylwia Kwiatkowska-Marks, *The influence of temperature on the methylene blue sorption process on calcium alginate* Przemysł Chemiczne, 2020, 99(1), 120-123, DOI: *10.15199/62.2020.1.17*
6. Sylwia Kwiatkowska-Marks, Justyna Miłek, Ilona Trawczyńska, *Diffusion of Cd(II), Pb(II) and Zn(II) on calcium alginate beads.*Technical Sciences, 2019, 22(1), 19–34
7. Justyna Miłek, Sylwia Kwiatkowska-Marks, Ilona Trawczyńska Application *of modified silica gel in the process of trypsin immobilization.* Technical Sciences, 2019, 22(1), 35–43
8. Sylwia Kwiatkowska-Marks, Justyna Miłek, Diffusive properties of alginate biosorbents. Ecological Chemistry and Engineering S 26(1), pp. 149-163, (2019), DOI: 10.1515/eces-2019-0011
9. Sylwia Kwiatkowska-Marks, Justyna Miłek, Slowing coefficient of diffusion of heavy metal salts in alginate granules. Engineering and Chemical Apparatus (2017), 56, 3, pp. 82-83.
10. S. Kwiatkowska-Marks, M. Wójcik, Removal of Cadmium(II) from Aqueous Solutions by Calcium Alginate Beads. Separation Science and Technology 49, pp. 2204-2211, (2014), DOI: 10.1080/01496395.2014.912223

11. L. Kopiński, S. Kwiatkowska-Marks, Utilization of waste newspaper using oyster mushroom mycelium. Industrial & Engineering Chemistry Research 51, pp. 4440-4444, (2012). DOI: 10.1021/ie202765b
12. S. Kwiatkowska-Marks, M. Wójcik, L. Kopiński, An alternative method to determine coefficient for shrinking core model. Polish Journal of Chemical Technology 13, **2**, 54-56, (2011), DOI: 10.2478/v10026-011-0024-7

**List of active participation in conferences:**
Since 2000, I have participated in 15 Polish and foreign conferences.

**List of participation in scientific grants:**
1. Grant from the Committee for Scientific Research entitled "Study of the sorption of Cu(II) and Cd(II) ions in alginates" (1998).
2. Supervisor grant from the Committee for Scientific Research, entitled "Research on the sorption of Cu(II) ions by alginates" (2001).

**Other important academic and professional achievements:**
1. In 2019 and 2020 – UTP Rector's Award for scientific achievements.
2. Member of the Polish Chemical Society and the Scientific Council of the Discipline of Chemical Engineering.
3. Representative of the Faculty of Economics and Technology for risk analysis.
4. Member of the Team for Promotion and Contact with Secondary Schools at the Faculty of Mathematics and Technology.
5. Since 2016, I have participated in 25 courses and trainings to improve my teaching skills.

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# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Sylwia Zielińska-Raczyńska

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

Professor of Natural Sciences, discipline of physics

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

1. NANO - physics, computer science, technology
2. Hot topics in modern physics

List of functions of supervisor or assistant supervisor of doctoral dissertations:

1. Dr David Ziemkiewicz – supervisor
2. Karol Karpiński, PhD - supervisor

**List of reviews in the procedure for scientific promotion:**

5 reviews in doctoral proceedings

**List of scientific publications:**

1. Optical properties of excitons in CdSe nanoplatelets and disks: real density matrix approach D Ziemkiewicz, G Czajkowski, S Zielińska-Raczyńska, arXiv preprint arXiv:2406.01144, 2024
2. Two-photon absorption in silicon using real density matrix approach, D Ziemkiewicz, D Knez, EP Garcia, S Zielińska-Raczyńska, G Czajkowski, arXiv preprint arXiv:2403.0101, 1, 2024
3. Optical properties of Rydberg excitons in-based superlattices, D Ziemkiewicz, G Czajkowski, S Zielińska-Raczyńska, Physical Review B 109 (8), 085309, 2, 2024
4. Excitonic superlens with copper and copper oxide, D Ziemkiewicz, K Karpiński, S Zielińska-Raczyńska, Physical Review B 108 (7), 075307, 2 2023, D Ziemkiewicz, S Zielińska-Raczyńska, Physical Review B 107 (19), 195303, 4, 2023
3. Copper plasmonics with excitons, D Ziemkiewicz, S Zielińska-Raczyńska, Physical Review B 106 (20), 205404, 7 2022
4. Superlens with copper and copper oxide, D Ziemkiewicz, K Karpiński, SZ Raczyńska, arXiv preprint arXiv:2210.10376 ,2022
5. Self-Kerr Effect across the Yellow Rydberg Series of Excitons in, C Morin, J Tignon, J Mangeney, S Dhillon, G Tchaikovsky, K Karpiński, ..., Physical Review Letters 129 (13), 137401, 21, 2022
6. Nonlinear optical properties and Kerr nonlinearity of Rydberg excitons in quantum wells, D Ziemkiewicz, G Czajkowski, K Karpiński, S Zielińska-Raczyńska, Physical Review B 106 (8), 085431, 5, 2022
7. Self-Kerr effect across the yellow Rydberg series, C Morin, J Tignon, J Mangeney, S Dhillon, G Tchaikovsky, K Karpinski, ..., arXiv preprint arXiv:2202.09239, 2022
8. Electro-optical properties of excitons in quantum wells. II. Continuum states, D Ziemkiewicz, G Czajkowski, K Karpiński, S Zielińska-Raczyńska, Physical Review B 104 (7), 075304, 2, 2021

9. Electro-optical properties of excitons in quantum wells. I. Discrete states, D Ziemkiewicz, G Czajkowski, K Karpiński, S Zielińska-Raczyńska, Physical Review B 104 (7), 075303,6, 2021,
10. Fractional Derivative Modification of Drude Model, Karpiński, S Zielińska-Raczyńska, D Ziemkiewicz, Sensors 21 (15), 4974, 4, 2021
11. Quantum confined Rydberg excitons in nanoparticles, K Orfanakis, SK Rajendran, H Ohadi, S Zielińska-Raczyńska, ..., Physical Review B 103 (24), 245426, 22, 2021
12. Aluminium-based plasmonic sensors in ultraviolet, K Karpiński, S Zielińska-Raczyńska, D Ziemkiewicz, Sensors 21 (12), 4096, 6, 2021
13. Condensed-matter-principia based information & statistical measures, A Gadomski, S Zielińska-Raczyńska, MDPI, 2021
14. Rydberg magnetoexcitons in quantum wells, D Ziemkiewicz, G Czajkowski, K Karpiński, S Zielińska-Raczyńska, Physical Review B 103 (3), 035305, 7, 2021
15. Long-range plasmons and epsilon-near-zero modes in ultraviolet, K Karpiński, S Zielińska-Raczyńska, D Ziemkiewicz, Journal of Optical Society of America B 38 (1), 79-87, 52021
16. Information and Statistical Measures in Classical vs. Quantum Condensed-Matter and Related Systems, A Gadomski, S Zielińska-Raczyńska, Entropy 22 (6), 645, 2, 2020
17. From quantum dots to bulk crystals and additional boundary conditions for Rydberg exciton-polaritons, D Ziemkiewicz, K Karpiński, G Czajkowski, S Zielińska-Raczyńska, Physical Review B 101 (20), 205202, 13, 2020
18. Electromagnetically induced transparency in media with rydberg excitons 2: Cross-kerr modulation, D Ziemkiewicz, S Zielińska-Raczyńska, Entropy 22 (2), 160, 6, 2020
19. Fractal Plasmons on Cantor Set Thin Film, D Ziemkiewicz, K Karpiński, S Zielińska-Raczyńska, Entropy 21 (12), 1176, 32019
20. Magneto-excitons in Cu2O: Theoretical model from weak to high magnetic fields, S Zielińska-Raczyńska, DA Fishman, C Faugeras, MMP Potemski, ..., New Journal of Physics 21 (10), 103012, 10, 2019
21. Nonlinear optical properties and self-Kerr effect of Rydberg excitons, S Zielińska-Raczyńska, G Czajkowski, K Karpiński, D Ziemkiewicz, Physical Review B 99 (24), 245206, 20, 2019
22. Solid-state pulsed microwave emitter based on Rydberg excitons, D Ziemkiewicz, S Zielińska-Raczyńska, Optics Express 27 (12), 16983-16994, 14, 2019
23. Towards Highly-Precise Tunable Electro-Modulator Based on Franz–Keldysh Effect, S Zielińska-Raczyńska, D Ziemkiewicz, G Czajkowski, K Karpiński, physica status solidi (b) 256 (6), 1800502, 2, 2019
24. Dynamically Steered Maser Action of Rydberg Excitons in Cu2O, D Ziemkiewicz, S Zielińska-Raczyńska, physica status solidi (b) 256 (6), 1800503, 3, 2019
25. Nonlinear Optical Properties and Self-Kerr Effect of Rydberg Excitons in Cu2O, S Zielińska-Raczyńska, G Czajkowski, K Karpiński, D Ziemkiewicz, arXiv preprint arXiv:1904.02959, 2019
26. Fractal Plasmons on Cantor Set Thin Film, K Karpiński, S Zielińska-Raczyńska, Entropy 21 (12), 1176, 2019

**List of patents and protective works:**
lack

**List of active participation in conferences: (from recent years)**

1. META'16 7th International Conference on Metamaterials, Photonic Crystals and Plasmonics, 25-28.07.2016, Malaga, Spain, Signal storage in tripod structure metamaterial - invited talk, Controlled signal propagation in a metamaterial analogue of tripod EIT medium

2. 18-th PLMCN, Physics of Light-Matter Coupling in Nanostructures Conference, 9-14.07.2017, Würzburg, Germany, Tunable plasmonic resonances in EIT media , Nonlinear optics enabled by strongly interacting Rydberg Excitons in Cu2O- invited talk
3. 2-nd International Workshop of Rydberg Excitons, Aarhus Denmark, 3-4 May 2018, Nonlinear quantum optics with Rydberg excitons (in linear regime of EIT) – invited talk, Rydberg excitons in the regime of Franz-Keldysh oscillations
4. 34 International Conference of the Physics of Semiconductors, Montpellier, France, 28-07-3-08.2018, Dynamically steered maser action of Rydberg excitons in Cu2O – invited talk 2. Towards highly-precise tunable electro-modulator based on Franz-Keldysh effect – paper 5. International Conference on Nonlinear Optics and Excitation Kinetics in Semiconductors
5. 5.NOEKS 14 Berlin, Germany, 23 – 27.09.2018 1 . Nonlinear quantum optics in the media with Rydberg excitons – invited talk 2. Dynamically generated maser action in Cu2O – paper 3. Electro and magneto-optical properties of Rydberg magnetoexcitons - comparison of the Faraday and Voigt configuration – referat
6. 7. 2-nd International Workshop of Rydberg Excitons, Durham United Kingdom, 3-4 May, 2021 – invited talk 8. 2-nd International Workshop of Rydberg Excitons, Aarhus Denmark, 9=-11 May, 2022 -invited talk 9. 2-nd International Workshop of Rydberg Excitons, Rostock, Germany, 18-12 June, 2023 – invited talk 10. 2-nd International Workshop of Rydberg Excitons, Dotrmund, Germany, 3-4 July 2014 – invited talk

**List of scholarships and scientific internships:**

1. 1985 UNESCO scholarship to the International Center for Theoretical Physics, Trieste-Miramare, Italy - 3 months (participation in the International School for Theoretical Physics: Atomic and Molecular Physics)
2. 1985 visiting scientist Instituto Fisica Atomica e Molecolare CNR Pisa, Italy – 1 month
3. 1986/87 Postdoctoral fellowship - Max Planck Institut für Quantenoptik, Garching bei
4. Muenchen, Germany, 12 months
5. 2007/08 visiting scientist Scuola Normale Superiore, Professor Giuseppe La Rocca's group, Pisa, Italy, 5 months in total (1.06-31.07, 1.-31.11.2007, 1.09-31.10.2018)
6. 2012, 1 month 1-31.10 visiting scientist Scuola Normale Superiore, group of Professor Giuseppe La Rocca, Pisa, Italy

**List of participation in scientific grants:**

1. 2005-07 KBN grant 1P03B01028 Propagation and retention of light pulses in atomic media with coherently modified optical properties (24 months) carried out at the Institute of Physics of the Nicolaus Copernicus University in Toruń, principal investigator: prof. dr hab. Jarosław Zaremba (team of 4), co-investigator
2. 2007-2008 grant PRIN 2006-021037 MUIR, Italy (Materiali a band-gap fotonica dipendente dal tempo per l'immagazinamento et elaborazione ottici dell'informazione – Toward all-optical information processing and storage in time-dependent photonic band-gap materials, 24 months, principal investigator Professor Giuseppe La Rocca, Scuola Normale Superiore, Pisa, investigator
3. 2008-2011 project no. 1/POKL/3.3.4/08 Hand in hand with Einstein – Supra-regional programmes for the development of students' skills in key competences, with particular emphasis on mathematical and natural sciences, 36 months, grant implemented by Gdańsk University of Technology and University of Technology and Life Sciences in Bydgoszcz, contractor

4. 2010-2013 Didactics and Practice project - implementation of the UTP development programme, 24 months, grant implemented at the University of Technology and Life Sciences in Bydgoszcz, co-investigator
5. 2010-2012 project POKL/04.01.02-00-166/11-00 Engineering studies as a guarantee of the development of UTP and knowledge-based society, 36 months, grant implemented at the University of Technology and Life Sciences in Bydgoszcz, principal investigator prof. dr hab. Janusz Prusiński, contractor
6. In 2018-2022, I carried out a research project of the National Science Centre as part of the OPUS 13 competition entitled Coherent interaction of Rydberg excitons with electromagnetic radiation, UMO-2017/25/B/ST3/00817, implementation period - 24 months until January 2021, function - principal investigator; a team of performers composed of: Prof. Gerard Czajkowski, David Ziemkiewicz, PhD, Karol Karpiński, M.Sc., (funds in the amount of PLN 303800.00)

**Other important academic and professional achievements:**
lack

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# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Łukasz Dąbrowski

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

chemistry, 2000, Ph.D.,

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

1. Modern techniques of qualitative and quantitative analysis in gas chromatography
2. Modern techniques of qualitative and quantitative analysis in gas chromatography

**List of functions of supervisor or assistant supervisor of doctoral dissertations:**
lack

**List of reviews in the procedure for scientific promotion:**
lack

**List of scientific publications:**

1. Studziński Waldemar, Narloch Izabela, Dąbrowski Łukasz, *Determination of the efficiency of electrolyzed water devices for the removal of pesticides in aqueous solutions and the characteristics of the pesticide residues and their transformation products,* Journal of Water Process Engineering, 2024, 61, 105372
2. Dąbrowski Łukasz, *Non-Target Screening of Chemicals in Selected Cotton Products by GC/MS and Their Safety Assessment,* Molecules, 2024, 29, 15 (3584), 1-14
3. Dąbrowski Łukasz, *Evaluation of a Simplified Method for GC/MS Qualitative Analysis of Polycyclic Aromatic Hydrocarbons, Polychlorinated Biphenyls,and Organic Pesticides Using PARADISe Computer Program,* Molecules, 2020, 25, 16, 3727.
4. Dąbrowski Łukasz, Evaluation of Solvents Used as Keepers in the Determination of Organic Pollutants by GC/MS, Molecules, 2020, 25, 19, 1-11.

**List of patents and protective works:**
lack

**List of active participation in conferences:**

1. Łukasz Dąbrowski, *Selected problems of qualitative analysis in GC/MS on the example of semivolatile environmental pollutants*, poster, 4th International Virtual Conference on
2. Chemistry and Analytical Chemistry, Chemistry Meeting 2024, August 24-25, Imperial Conferences, London, UK, 2024
3. Narloch Izabela, Dąbrowski Łukasz, Studziński Waldemar, *Analysis of the products of 2-phenylphenol transformations occurring under the influence of tap water subjected to the electrolysis process,* poster, XI Polish Conference on Analytical Chemistry, Lodz, June 19-23, 2022, Lodz University of Technology, Faculty of Chemistry, Committee on Analytical Chemistry of the Polish Academy of Sciences, University of Lodz, Faculty of Chemistry, Lodz:

Lodz University of Technology, 2022, p.164

4. Studziński Waldemar, Narloch Izabela, Dąbrowski Łukasz, *Analysis of selected parameters of water subjected to electrolysis in a food purification device,* poster, I National Scientific Conference "Food and nutrition in a nutshell", Gdańsk 9.04.2022, Department of Bromatology of the Medical University of Gdańsk SKN Bromatology at the Department of Bromatology of the Medical University of Gdańsk, Gdańsk: Organizing Committee of the I National Scientific Conference "Food and nutrition in a nutshell", 2022, p.100
5. Dąbrowski Łukasz, Studziński Waldemar, Narloch Izabela, *Analysis of pesticide degradation products in electrolysed water produced in food purification devices,* poster, SelectScience Virtual Analitycal Summit 2022, 15.02.2022, SelectScience, 2022
6. Narloch Izabela, Dąbrowski Łukasz, Wejnerowska Grażyna, *The influence of the method of preparing a milk sample for analysis on the determination of the fatty acid profile,* poster, XI Polish Conference on Analytical Chemistry, Lodz, June 19-23, 2022, Lodz University of Technology, Faculty of Chemistry, Committee on Analytical Chemistry of the Polish Academy of Sciences, University of Lodz, Faculty of Chemistry, Lodz : Lodz University of Technology, 2022, p. 163
7. Dąbrowski Łukasz, *Problems of qualitative analysis in gas chromatography coupled with mass spectrometry,* paper, V National Scientific Conference Applications of chromatography in scientific works; Abstracts / Kinga Kalbarczyk Konrad Skrzątek, Lublin: 25.06.2021, TYGIEL FOUNDATION, Lublin: Foundation for the Promotion of Science and Development TYGIEL, 2021, p.23
8. Gal Emese, Dąbrowski Łukasz, *Development of extraction and analytical method for determination of fungicide residues in cardboard samples,* poster, XXVI. Nemzetközi Vegyészkonferencia / 26th International Conference on Chemistry, on-line: 30.10.2020, Erdélyi Magyar Műszaki Tudományos Társaság (EMT) Hungarian Technical Scientific Society of Transilvania Babes-Bolyai University Cluj-Napoca, Transinvalia : Erdélyi Magyar Műszaki Tudományos Társaság (EMT) / Hungarian Technical Scientific Society of Transilvania, 2020
9. Wejnerowska Grażyna, Dąbrowski Łukasz, Gackowska Alicja, *Application of Stir Bar Sorptive Extraction with Liquid Desorption to the Determination of Chlorinated Hydrocarbons in Water Samples,* poster, 25th International Symposium on Separation Sciences, Book of Abstracts, Łódź: 15-18.09.2019, Lodz University of Technology University of Lodz, Lodz: Lodz University of Technology, 2019, p.108
10. Dąbrowski Łukasz, Wejnerowska Grażyna, Gackowska Alicja, , poster, 25th International Symposium on Separation Sciences, Book of Abstracts, Łódź: 15-18.09.2019, Lodz University of Technology University of Lodz, Lodz: Lodz University of Technology, 2019, p.107

**List of scholarships and scientific internships:**
lack

**List of participation in scientific grants:**
lack

**Other important academic and professional achievements:**

1. Member of the Analytical Chemistry Teaching Team of the Committee on Analytical Chemistry of the Polish Academy of Sciences,
2. Medal of the National Education Commission in 2022,
3. Rector's Award (on the occasion of the 30th anniversary of work) from 14.10.2022

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# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Łukasz Skowroński

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

M.Sc., 2005, technical physics, J. and J. Śniadecki University of Technology and Agriculture (currently J. and J. Śniadecki Bydgoszcz University of Technology)
PhD, 2013, Field: Exact and Natural Sciences, Discipline: Physical Sciences
hab., 2021, field of engineering, technical sciences, discipline: materials engineering

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

1. Modern functional materials
2. Thin-film systems – preparation and properties

**List of functions of supervisor or assistant supervisor of doctoral dissertations:**

Supervisor of doctoral dissertations:

1. Piotr Dywel, Ph.D., Eng., "Influence of laser micromachining parameters on the microstructure and performance properties of selected steel and aluminum alloy grades", field: engineering and technical sciences, discipline: mechanical engineering, 2024

Ongoing:

2. Mateusz Chorobiński (since 2020), Doctoral School of the J. and J. Śniadecki Bydgoszcz University of Technology (discipline: chemical sciences), "The effect of ultramarine and titanium dioxide on the stability of selected properties of polystyrene and high-density polyethylene"
3. Aleksandra Olszewska (since 2020), Doctoral School of the J. and J. Śniadecki Bydgoszcz University of Technology (discipline: chemical sciences), "The influence of oxidation time and temperature on the microstructure and optical properties of core-shell catalytic systems (gold nanoparticles in the SnO2 matrix; Au@SnO2)",

Auxiliary supervisor:

1. Tomasz Rerek, PhD, Eng., "Influence of the growth of Au-Sn layers obtained by PVD on their optical and microstructural properties", field: exact and natural sciences, discipline: physical sciences, 2021

**List of reviews in the procedure for scientific promotion:**

Reviews in the procedure for awarding the degree of habilitated doctor:

1. 2022, Paweł Piotr Michałowski, PhD, DSc, Eng., "Characterization of semiconductor structures with nanometer and subnanometer depth resolution using the Secondary Ion Mass Spectrometry method", field: engineering and technical sciences, discipline: materials science (Faculty of Materials Engineering, Warsaw University of Technology)

2. 2024, Barbara Hajduk, PhD, DSc, Eng., "Application of spectroscopic ellipsometry to the study of layers of selected polymers, blends and composites for optics and optoelectronics", field: exact and natural sciences, discipline: physical sciences (Faculty of Physics, Astronomy and Applied Computer Science, Nicolaus Copernicus University in Toruń)

**List of scientific publications:**

1. Winiecki M, Stepczyńska M, Moraczewski K, Skowroński Ł, Trzciński M, Rerek T, Malinowski R., Effect of low-temperature oxygen plasma treatment of titanium alloy surface on tannic acid coating deposition, Materials, 2024, 17, 5 (1065), 1-14, 10.3390/ma17051065
2. Jankowska D, Łakomska I, Muziol T, Skowronski L, Rerek T, Popielarski P, Barwiołek M., The optical properties of 3 + 3 macrocyclic Schiff base thin material obtained by the Molecular Beam Epitaxy method, Spectrochimica Acta Part A: Molecular And Biomolecular Spectroscopy, 2024, 125229, 10.1016/j.saa.2024.125229
3. Wicher B, Chodun R, Greczyński G, Lachowski A, Trzciński M, Pshyk A, Król K, Kulikowski K, Skowroński Ł, Zdunek K., Carbon ion self-sputtering attained by sublimation of hot graphite target and controlled by pulse injection of a neon-helium gas mixture, Applied Surface Science, 2023, 620, 156708, 10.1016/j.apsusc.2023.156708
4. Dzienny P, Rerek T, Szczęsny R, Trzcinski M, Skowroński Ł, Antończak A., Laser-induced alloy nanoparticles: Au-Sn thin film morphology influence on the dewetting process, The International Journal of Advanced Manufacturing Technology, 2023, 1-12, 10.1007/s00170-023-12403-z
5. Sypniewska M, Szczęsny R, Skowroński Ł, Kamedulski P, Gondek E, Apostoluk A, Derkowska-Zielinska B., Optical and morphological properties of ZnO and Alq3 incorporated polymeric thin layers fabricated by the dip-coating method, Applied Nanoscience, 2023, 13, 4902-4912, 10.1007/s13204-022-02647-8
6. Skowroński Ł, Chodun R, Trzcinski M, Zdunek K., Optical properties of amorphous carbon thin films fabricated using a High-Energy-Impulse Magnetron-Sputtering technique, Materials, 2023, 16, 21 (7049), 1-14, 10.3390/ma16217049
7. Chorobiński M, Śmiałek P, Gordel-Wójcik M, Petrusevich E, Zych E, Plażuk D, Skowronski L, Jędrzejewska B., Photophysical and optical properties of 4-(4'-(diphenylamino)benzylidene)-2-phenyloxazol-5(4H)-ones induced by the peripheral substituent, Journal of Luminescence 2023, 255, 119584, 1-13, 10.1016/j.jlumin.2022.119584
8. Pyszka I, Skowroński Ł, Jędrzejewska B., Study on New Dental Materials Containing Quinoxaline-Based Photoinitiators in Terms of Exothermicity of the Photopolymerization Process, International Journal of Molecular Sciences, 2023, 3 (2752), 1-13, 10.3390/ijms24032752
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10. Chodun R, Skowroński Ł, Trzcinski M, Nowakowska-Langier K, Kulikowski K, Naparty M, Radziszewski M, Zdunek K., The amorphous carbon thin films synthesized by Gas Injection Magnetron Sputtering technique in various gas atmospheres, Coatings, 2023, 13, 5 (827), 1-21, 10.3390/coatings13050827
11. Wicher B, Chodun R, Skowroński Ł, Trzcinski M, Kulikowski K, Zdunek K., Design of thin DLC/TiO2 film interference coatings on glass screen protector using a neon–argon-based gas injection magnetron sputtering technique, Diamond & Related Materials, 2022, -, 123, 108859, 10.1016/j.diamond.2022.108859

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13. Wspieralski P, Mosińska L, Skowroński Ł, Szczęsny R, Figa V, Naparty M, Derkowska-Zielinska B., Influence of Heat Treatment on Surface, Structural and Optical Properties of Nickel and Copper Phthalocyanines Thin Films, International Journal of Molecular Sciences, 2022, 23, 11055, 10.3390/ijms231911055
14. Chomicki D, Kharchenko O, Skowroński L, Kowalonek J, Smokal V, Krupka O, Derkowska-Zielińska B., Influence of methyl group in a quinoline moiety on optical and light-induced properties of side-chain azo-polymers, Applied Nanoscience, 2022, 12, 897-905, 10.1007/s13204-021-01764-0
15. Dzienny P, Szczęsny R, Rerek T, Trzcinski M, Skowroński Ł., Laser-induced alloy nanoparticles on Au-Sn thin layers, Applied Surface Science, 2022, 591, 153147, 1-12, 10.1016/j.apsusc.2022.153147
16. Peplowski L, Szczęsny R, Skowroński L, Krupka A, Smokal V, Derkowska-Zielińska B., Vibrational spectroscopy studies of methacrylic polymers containing heterocyclic azo dyes, Vibrational Spectroscopy, 2022, 120, 103377, 10.1016/j.vibspec.2022.103377
17. Wicher B, Chodun R, Trzcinski M, Nowakowska-Langier K, Skowroński Ł, Lachowski A, Zdunek K., Applications insight into the plasmochemical state and optical properties of amorphous CNx films deposited by gas injection magnetron sputtering method, Applied Surface Science, 2021, 565, 1, 150540, 10.1016/j.apsusc.2021.150540
18. Ścigała A, Szłyk E, Rerek T, Wiśniewski M, Skowroński Ł, Trzcinski M, Szczęsny R., Copper Nitride Nanowire Arrays - Comparison of Synthetic Approaches, Materials, 2021, -, 14, 603, 10.3390/ma14030603
19. Rerek T, Derkowska-Zielińska B, Trzcinski M, Szczęsny R, Naparty M, Skowronski L., Influence of the Microstructure and Optical Constants on Plasmonic Properties of Copper Nanolayers, Materials, 2021, 14, 23, 7292, 10.3390/ma14237292
20. Skowroński Ł, Trzcinski M, Olszewska A, Szczęsny R., Microstructure and Optical Properties of Nanostructural Thin Films Fabricated through Oxidation of Au-Sn Intermetallic Compounds, Materials, 2021, -, 14, 4034, 10.3390/ma14144034
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22. Tworek M, Skowroński Ł, Makarewicz E, Kowalik J., Properties of poly (vinyl chloride) membranes containing cadmium pigments, irradiated with UV radiation, Scientific Reports, 2021, vol. 11, -, 18165, 10.1038/s41598-021-96713-w
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27. Sędzicki P, Skowroński L, Szczęsny R, Becker H, Rogalla D, Pawlak M, Derkowska-Zielińska B., Influence of phosphorus ion implantation on the optical properties of CdTe bulk crystal, Journal of Alloys and Compounds, 2020, 844, -, 156002, 10.1016/j.jallcom.2020.156002
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30. Skowronski L., Optical and Microstructural Characterization of Thin Layers, Crystals, 2020, 10, -, 749, 10.3390/cryst10090749
31. Dywel P, Skowroński Ł., Optical characterization of thin Al2O3 layers deposited by magnetron sputtering technique at industrial conditions for applications in glazing, Materials Science-Poland, 2020, 38, 1, 108-115, 10.2478/msp-2019-0093
32. Skowroński Ł., Optical Properties of Titanium in the Regime of the Limited Light Penetration, Materials, 2020, 13, 4, 1-12, 10.3390/ma13040952
33. Chomicki D, Kharchenko O, Skowroński L, Kowalonek J, Kozanecka-Szmigiel A, Szmigiel D, Smokal V, Krupka O, Derkowska-Zielińska B., Physico-Chemical and Light-Induced Properties of Quinoline Azo-dyes Polymers, International Journal of Molecular Sciences, 2020, 21, -, 5755, 10.3390/ijms21165755
34. Dywel P, Szczęsny R, Domanowski P, Skowroński Ł., Structural and Micromechanical Properties of Nd:YAG Laser Marking Stainless Steel (AISI 304 and AISI 316), Materials, 2020, 13(9), 2168, 1-14, 10.3390/ma13092168
35. Szczęsny R, Ścigała A, Derkowska-Zielińska B, Skowroński Ł, Cassagne C, Boudebs G, Viter R, Szłyk E., Synthesis, Optical, and Morphological Studies of ZnO Powders and Thin Films Fabricated by Wet Chemical Methods, Materials, 2020, 13, 11, 1-17, 10.3390/ma13112559
36. Rerek T, Skowroński L, Szczęsny R, Naparted M, Derkowska-Zielińska B., The effect of the deposition rate on morphology, opto-electronic properties and formation intermetallic compounds of AueSn alloys, Journal of Alloys and Compounds, 2020, -, 849, 156041, 10.1016/j.jallcom.2020.156041
37. Skowronski L, Chodun R, Zdunek K., TiO2 - based decorative interference coatings produced at industrial conditions, Thin Solid Films, 2020, 711, -, 138294, 10.1016/j.tsf.2020.138294
38. Wicher B, Chodun R, Nowakowska-Langier K, Trzcinski M, Skowroński Ł, Okrasa S, Minikayev R, Naparta M, Zdunek K., Chemical and structural characterization of tungsten nitride (WNx) thin films synthesized via Gas Injection Magnetron Sputtering technique, Vacuum, 2019, -, 165, 266-273, 10.1016/j.vacuum.2019.04.020
39. Ciesielski A, Skowroński L, Trzciński M, Górecka E, Pacuski W, Szoplik T., Interaction of Te and Se interlayers with Ag or Au nanofilms in sandwich structures, Beilstein Journal of Nanotechnology, 2019, -, 10, 238-246, 10.3762/bjnano.10.22
40. Chorobiński M, Skowroński Ł, Bieliński M., Methodology for determining selected dyeing characteristics of polyethylene using the CIELab system, Polimery, 2019, 64, 10, pp. 690-696, 10.14314/polimery.2019.10.6

41. Chodun R, Skowronski L, Okrasa S, Wicher B, Nowakowska-Langier K, Zdunek K., Optical TiO2 layers deposited on polymer substrates by the Gas Injection Magnetron Sputtering technique, Applied Surface Science, 2019, 466, -, 12-18, 10.1016/j.apsusc.2018.10.003
42. Rerek T, Skowroński L, Szczęsny R, Naparted M, Derkowska-Zielińska B., The effect of the deposition rate on microstructural and opto-electronic properties of β-Sn layers, Thin Solid Films, 2019, 670, -, 86-92, 10.1016/j.tsf.2018.12.009
43. Skowroński Ł, Chorobiński M., The effect of thickness and optical constants of the dielectric layer on the color behaviour of the glass/Ti/TiO2 decorative coatings, Thin Solid Films, 2019, 691, -, 137595, 10.1016/j.tsf.2019.137595

**List of patents and protective works:**

1. P.449747 (compound), "A method for obtaining gold nanolayered wafers by physical vapor deposition (PVD)"

**List of active participation in conferences:**

1. (INVITED) Metallic and alloy nanolayers as precursors for Semiconducting Metal Oxide Nanostructures, 5rd International Congress on Advanced Materials Sciences and Engineering, 23-26.07.2024, Lovren, Croatia
2. TiO2 - based decorative coatings - fundamentals and manufacturing, 3rd International Congress on Advanced Materials Sciences and Engineering, 21-25.07.2022, Opatija, Croatia
3. Ellipsometry study of TiO2/Ti/Glass decorative coatings – the effect of thickness and optical constants of the dielectric layer, 8th International Conference on Spectroscopic Ellipsometry (ICSE8), 26-31.05.2019, Barcelona, Spain

**List of scholarships and scientific internships:**

1. Industrial (training) internship at Bohamet S.A. in the period from 03.07.2017 to 28.07.2017
2. Industrial (training) internship at Biuro Projekto-Wdrożeniowe Piotr Domanowski in the period from 18.07.2016 to 19.08.2016
3. 2012, Scholarship for PhD students, *Step into the future - scholarships for PhD students IV edition*, issuing authority: Marshal of the Kujawsko-Pomorskie Voivodeship
4. 2017, Scholarship of the Mayor of the City for outstanding young scientists, the body issuing the award: Mayor of the City of Bydgoszcz

**List of participation in scientific grants:**

1. High-quality DLC coatings produced by novel high-power magnetron sputtering using a hot graphite target
   project financed by National Science Centre (OPUS 16), decision number: UMO-2018/31/B/ST8/00635
   Principal Investigator: prof. Zdunek (Warsaw University of Technology)
   Implementation period: 2019-2023
   Nature of participation in the project: Contractor
2. Catalytic systems Au@SnO2 produced by selective oxidation of the intermetallic compounds AuSn and AuSn2
   project financed by NCN (Miniatura 3), decision number: 2019/03/X/ST5/00452
   Completion date: 2019-2020
   Nature of participation in the project: principal investigator
3. Synthesis and characterization of copper nitride layers obtained by plasma surface engineering methods
   project financed by National Science Centre, Decision No. DEC-2014/15/B/ST8/01692

Completion date: 2015 – 2018
Nature of participation in the project: Contractor

4. New advanced Al-Ti sandwich materials with enhanced ballistic resistance for aerospace structures
   Project of the National Centre for Research and Development under the Applied Research Programme
   Contract number: PBS2/A5/35/2013
   Nature of participation in the project: Contractor
5. Technology for surface modification of polymer products using laser light
   Project: Innovation Incubator +, Smart Growth Operational Programme 2014-2020 (Measure 4.4)
   Application No. 08/01/2017/UTP
   Nature of participation in the project: Contractor
6. Development of a Low-Cost Method for the Preparation of Cu-Ni Plate of a Flat Plate Solar Collector and Characterization of Its Absorption-Emission Properties
   Pilot program in the Kujawsko-Pomorskie Voivodeship Research voucher
   Regional Programme National Cohesion Strategy
   Completion: 2012-2013
   Nature of participation in the project: principal investigator

**Other important academic and professional achievements:**

1. Development of a method for the production of homogeneous thin layers of Au-Sn intermetallic compounds (in the diffusion process) and development of a method for the production of layers of core-shell (Au@SnOx) or multi-shell structures by their oxidation;
2. Optimization of the process of manufacturing dielectric layers (e.g. TiO2, ZnO) using PVD methods;
3. Determination of the influence of growth/production technology conditions on the optical properties of copper nitride layers (together with the Faculty of Chemistry of the Nicolaus Copernicus University in Toruń – first position and the National Centre for Nuclear Research in Otwock – second and third position);
4. Determination of the relationship between the microstructure and optical properties of thin-film systems and the conditions of their growth in coatings obtained by the magnetron method on large-size substrates and carbon materials.

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# CRITERION 3

## Qualifications of academic teachers or research staff conducting education at the doctoral school

**persons participating in education in the basic programme**
**who have not been listed as part of education in disciplines**

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# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Adam Skowron

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

Doctor of Humanities in Philosophy, 2021

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

1. Philosophy of Cognition
2. Ethics in Science
3. Ethics in science

The following lists refer to the last 5 years, with particular emphasis on achievements related to classes conducted at the Doctoral School of the Bydgoszcz University of Technology.

**List of doctoral dissertation supervisor functions:**
lack

**List of reviews in the procedure for scientific promotion:**
lack

**List of scientific publications:**
Monographs:

1. *De monadibus. Leibniz and Kant on Monads,* ed. Adam Marszałek, Toruń 2020, ISBN: 978-83-8180-366-3.
2. *Meaning – Self-awareness – Happiness. A contribution to the realization of life success* (co-authored with: Dariusz Adamczyk, Artur Krysik), ed. Pedagogical University of Krakow Press, Krakow 2019. ISNB: 978-83-8084-368-4.
3. *The phenomenon of human suffering. Quality of life – support – formation* (co-authored with: Dariusz Adamczyk, Małgorzata Kaleta-Witusiak), ed. Publishing House of the Pedagogical University of Krakow, Krakow 2021. ISBN: 978-83-8084-649-4.
4. *Essays in Medical Ethics* (co-authored with: Janusz Sytnik-Czetwertyński), ed. Adam Marszałek, Toruń 2021. ISBN: 978-83-8180-523-0.
5. *Death-loss-mourning. Towards Regaining Sense* (co-authored with: Dariusz Adamczyk, Sylwester Bębas), ed. Pedagogical University of Krakow Press, Krakow 2024 [in press].

Chapters in monographs:

1. *Ethics in the Profession of Cosmetologist* [in:] *Cosmetology,* Volume 2, ed. Kołodziejczyk A., ed. Wydawnictwo Lekarskie PZWL, Warsaw 2020, ISBN: 978-83-200-5747-8. pp. 606-609.
2. *Ethics of Work in a Team – Submissive Caregivers in Health Care* [in:] *Work in Therapeutic Teams,* ed. Wrześniewska-Wal I., Cianciara D., Augustynowicz A., ed. Wydawnictwo Naukowe PWN, Warsaw 2020, ISBN: 978-83-01-21562-0. pp. 143-151.
3. *Happiness – an undefined goal* [in:] *How to live, doctor?,* ed. Śliż D., Mamcarz A., wyd. Medical Education, Warsaw 2020, ISBN: 978-83-65471-84-0. pp. 87-95.

4. *Inequalities in Health* (co-authored with: Justyna Grudziąż-Sękowska) [in:] *Contemporary Challenges of Public Health,* ed. Pinkas J., ed. Wydawnictwo Lekarskie PZWL, Warsaw 2021, ISBN: 978-83-200-6438-4. pp. 109-125.
5. *The Axiological Dimension of Solitude* [in:] *Man in the World of Values. Values as a Correlate of Collective Behavior,* ed. Tarczyński A., ed. Kazimierz Wielki University Press, Bydgoszcz 2021, ISBN: 978-83-8018-390-2. pp. 114-123.

Publications in scientific journals:

1. *Application of the Concept of Independent Ethics in the Medical Profession* [in:] *Philosophical Movement,* Vol 77, No 1, wyd. Nicolaus Copernicus University, Toruń, 2021.
2. *Critique of Pre-Statutory Harmony in the Letters of Leonhard Euler* [in:] *Philosophical Quarterly,* Vol. XLVI, Issue 4, ed. Polish Academy of Arts and Sciences, Kraków 2019, ISSN 1230-4050, pp. 193-205.
3. *Leonhard Euler: Letters to the German Princess on Various Objects of Physics and Philosophy* (translation) [in:] *Kwartalnik Filozoficzny,* Vol. XLVI, Issue 4, ed. Polish Academy of Arts and Sciences, Kraków 2019, ISSN 1230-4050, pp. 207-223.
4. *A dispute over the formal nature of time. Stattler-Weishaupt-Kant* [in:] *Kwartalnik Filozoficzny,* Vol. XLVII, Issue 3, ed. Polish Academy of Arts and Sciences, Kraków 2019.
5. *Structural Analysis of the Polish Code of Medical Ethics* (co-authored with: Anna Augustynowicz, Michał Waszkiewicz, Konrad Zygarski, Janusz Sytnik-Czetwertyński) [in:] *Journal of Education, Health and Sport,* Vol 9, No 7, ed. Kazimierz Wielki University, Bydgoszcz 2019, eISSN 2391-8306, pp. 31-47.
6. *Interdisciplinarity and multidisciplinarity of the medical profession. Opportunity or threat?* (co-authored with: Janusz Sytnik-Czetwertyński, Anna Augustynowicz, Michał Waszkiewicz, Justyna Grudziąż-Sękowska, Dariusz Hajdukiewicz, Bartosz Kobuszewski, Lidia Janiszewska, Iwona Wrześniewska-Wal) [in:] *Journal of Education, Health and Sport*, Vol 9, No 7, ed. Kazimierz Wielki University, Bydgoszcz 2019, eISSN 2391-8306, pp. 124-141.
7. *Critical Analysis of the Polish Code of Medical Ethics* (co-authored with: Anna Augustynowicz, Janusz Sytnik-Czetwertyński, Michał Waszkiewicz, Małgorzata Grochala) [in:] *Journal of Education, Health and Sport*, Vol 9, No 7, ed. Kazimierz Wielki University, Bydgoszcz 2019, eISSN 2391-8306, pp. 113-123.
8. *A systematic Analysis of the Polish Code of Medical Ethics* (co-authored with: Anna Augustynowicz, Michał Waszkiewicz, Mateusz Eid, Janusz Sytnik-Czetwertyński) [in:] *Journal of Education, Health and Sport*, Vol 9, No 7, ed. Kazimierz Wielki University, Bydgoszcz 2019, eISSN 2391-8306, pp. 103-112.
9. *Specialty training system in Poland in 2011-2018 according to the Centre of Postgraduate Medical Education register data* (co-authored with: Wojciech Stefan Zgliczyński, Zbigniew Węgrzyn, Mariusz Ruiz, Andrzej Żochowski, Mateusz Jankowski, Bartosz Kobuszewski, Janusz Sytnik-Czetwertyński, Jarosław Pinkas) [in:] *Medical Knowledge,* Vol 2, No 1, wyd. Medical Center for Postgraduate Education, Warsaw 2020, pp. 1-8.
10. *Medical tourism in Poland: the perspective and experience of the physicians* (co-authored with: Mateusz Jankowski, Wojciech Stefan Zgliczyński, Bartosz Kobuszewski, Janusz Sytnik-Czetwertyński, Jarosław Pinkas) [in:] *Medical Knowledge,* Vol 2, No 1, wyd. Medical Center for Postgraduate Education, Warsaw 2020, pp. 26-29.
11. *Towards the mind-body problem* (co-authored with: Janusz Sytnik-Czetwertyński) [in:] *Journal of Education, Health and Sport,* Vol. 11, No 10, ed. Kazimierz Wielki University, Bydgoszcz 2021, eISSN 2391-8306, pp. 116-126.
12. *Medical education in Poland and the COVID-19 pandemic – opportunities and threats* (co-authored with: Janusz Sytnik-Czetwertyński) [in:] *Journal of Education, Health and Sport,* Vol. 11, No 12, wyd. Nicolaus Copernicus University in Toruń, Toruń 2021, pp. 374-384.
13. *The prevalence of tobacco, heated tobacco, and e-cigarette use in Poland: a 2022 web-based cross-sectional survey* (co-authored with: Mateusz Jankowski, Aurelia Ostrowska, Radosław

Sierpiński, Janusz Sytnik-Czetwertyński, Giermaziak Wojciech, Mariusz Gujski, Waldemar Wierzba, Jarosław Pinkas) [in:] *International Journal of Environmental Research and Public Health,* Vol. 19, No 8, 2022. pp. 1-12.

14. *Polish ethics and medicine in XXI century (opportunities and threats)* (co-authored with: Janusz Sytnik-Czetwertyński, Janusz Ostrowski, Jarosław Pinkas) [in:] *Medical Knowledge,* Vol. 4, No 1, 2022, pp. 8-11.
15. *The problem of paramedicine in Poland - from the ethical point of view* (co-authored with: Janusz Sytnik-Czetwertyński, Janusz Ostrowski, Jarosław Pinkas) [in:] *Medical Knowledge*, Vol. 4, No 1, 2022, pp. 12-15.
16. *Medical ethics in the Middle Ages – European Area* [in:] *Contemporary Dentistry,* Vol 29, No 2, 2022, pp. 50-54.
17. *Medical ethics in the modern era. The Thomas Percival Code* [in:] *Contemporary Dentistry*, Vol. 29, No 4, 2022, pp. 37-42.
18. *Magical medicine of the sixteenth and seventeenth centuries* [in:] *Stomatologia Współczesna,* Vol. 29, No 5, 2022, pp. 30-36.
19. *Demographics, practice patterns, job satisfaction, and career plans of endocrinologists in Poland* (co-authored with: Wojciech Zgliczyński) [in:] *Endokrynologia Polska*, 74(3), 2023, pp. 331-339.
20. *Professional Autonomy of a Physician as an Ethical Value* [in:] *Stomatologia Współczesna*, Vol. 30, No 1, 2023, pp. 36-41.
21. *Medical ethics in antiquity. The Hippocratic Oath* [in:] *Stomatologia Współczesna*, Vol. 30, No 2, 2023, pp. 34-40.
22. *Medical ethics in the Victorian era. The Jukes de Styrapa Codex* [in:] *Stomatologia Współczesna*, Vol. 30, No 3, 2023, pp. 42-48.
23. *Medical ethics in the Victorian era. Code of Jukes de Styrap* [in:] *Stomatologia Współczesna*, Vol. 30, No 3, 2023, pp. 49-54 (English version of the above article).
24. *Medical ethics in the eighteenth century. Bard, Gregory* [in:] *Stomatologia Współczesna*, Vol. 30, No 4, 2023, pp. 48-53.
25. *Ethical issues in medical treatment of homeless patients in Poland. A preliminary study* (co-authored with: Alicja Jankowska, Janusz Sytnik-Czetwertyński) [in:] *Journal of Education, Health and Sport*, Vol. 13, No 2, 2023, pp. 68-74.
26. *An Outline of Medical Ethics by Władysław Biegański* [in:] *Stomatologia Współczesna*, Vol 29, No 6, 2022, pp. 34-40.
27. *Proto-codes of medical ethics: Statuta Moralia Collegii Regalis Medicorum Londinensium (1722)* [in:] *Stomatologia Współczesna*, Vol 30, No 5-6, 2023, pp. 34-40.

**List of patents and protective works:**
lack

**List of active participation in conferences:**

1. Paper: *Medical education in the era of the COVID-19 pandemic* at the scientific conference *COVID-19 pandemic: A year of experience,* Medical Center for Postgraduate Education in Warsaw, Warsaw, 22.03.2021.
2. Paper: *Ethical dilemmas in the era of the COVID-19 pandemic* at the scientific conference *COVID-19 pandemic – two years of experience,* Medical Center for Postgraduate Education in Warsaw, Warsaw, 21.03.2022.

**List of scholarships and scientific internships:**

1. Scholarship of the Minister of Science and Higher Education for significant achievements for the academic year 2019/2020, Warsaw, 19.12.2019.

**List of participation in scientific grants:**

1. *Inedita Kazimierz Twardowski* (principal investigator: prof. dr hab. Anna Brożek), contractor, civil-law contract with the Faculty of Philosophy, University of Warsaw, 2020-2023.

**Other important academic and professional achievements:**

1. Award for the best student of the Faculty of Administration and Social Sciences of the Kazimierz Wielki University in the academic year 2018/2019, Bydgoszcz, 30.09.2019.
2. Award of the Rector of the Kazimierz Wielki University for the best student of the Kazimierz Wielki University in the academic year 2018/2019, Bydgoszcz, 8.10.2019.
3. Scholarship of the Minister of Science and Higher Education for significant achievements for the academic year 2019/2020, Warsaw, 19.12.2019.
4. Distinction of the Council of the College of the Kazimierz Wielki University in Bydgoszcz for very good academic results and scientific achievements, Bydgoszcz, 15.09.2020.
5. Rector's Award for the best graduate of the College I of the Kazimierz Wielki University in Bydgoszcz for the academic year 2019/2020 for scientific achievements, Bydgoszcz, 13.10.2020.
6. Third Degree Team Award of the Director of the Center for Postgraduate Medical Education in Warsaw for didactic achievements in 2020.
7. Third degree Team Award of the Director of the Center for Postgraduate Medical Education in Warsaw for didactic achievements in 2021.

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# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Agnieszka Kamyk-Wawryszuk

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

2016 - PhD/ social sciences/ pedagogy
2024 – habilitated doctor/ field of social sciences/ pedagogy

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

1. Pedagogical course — Pedagogy of higher education block

**List of functions of supervisor or assistant supervisor of doctoral dissertations:**
lack

**List of reviews in the procedure for scientific promotion:**
lack

**List of scientific publications:**
Monographs:

1. Kamyk-Wawryszuk A. (2023). Children with rare neurological diseases. Educational and communication resources and needs. Bydgoszcz: Publishing House of the Kazimierz Wielki University in Bydgoszcz, pp. 508, ISBN 978-83-8018-584-5

Books edited by:

1. Kamyk-Wawryszuk A. (ed.) (2022). Speech and communication disorders of a child with a rare disease: selected issues of diagnosis and therapy, Bydgoszcz: UKW Publishing House.

Publications:

1. Kamyk-Wawryszuk A, Speech of a child diagnosed with 5p deletion syndrome (Cridu Chat syndrome) in the opinion of parents - research report. In: Speech and communication disorders of a child with a rare disease: selected issues of diagnosis and therapy / ed. A. Kamyk-Wawryszukm, Bydgoszcz: Kazimierz Wielki University Press, 2022.
2. Kamyk-Wawryszuk A., Rare diseases as an area of interest for speech therapists – a few preliminary reflections, In: Speech and communication disorders of a child with a rare disease: selected issues of diagnosis and therapy / ed. A. Kamyk-Wawryszukm, Bydgoszcz: Kazimierz Wielki University Press, 2022.
3. Kamyk-Wawryszuk A., Complex communication needs of a child diagnosed with Dandy-Walker syndrome and mucopolysaccharidosis type II. Case study, Logopaedica Lodziensia, 2021, No. 5, pp. 69-85.
4. Kamyk-Wawryszuk, A. Rare disability as an absent category in the education of preschool and early school education teachers. Elementary Education in Theory and Practice, 2021, 51-64.
5. Kamyk-WawrvszukA., Macroglossia as a co-occurring defect in mucopolysaccharidosis type I and its consequences in the speech therapy aspect. Case study, In: Human health in ontogeny.

Biomedical and psychosocial aspects. Studies of Polish, Slovak and Czech researchers. T. I. Biomedical Aspects / ed. Ryszard Plinta, Miron Sramka, Anna Brzęk, Katowice: Medical University of Silesia, 2020, pp. 131-140.

6. Kamyk-Wawryszuk A, From preschooler to pupil - redefining or intensifying the educational needs of a child with Sanfilippo disease W: From integration to inclusion. 30 years of inclusive education - idea and reality. T. I. / ed. Ewa M. Kulesza, Danuta Al-Khamisy, Paulina Zalewska. Warsaw, Maria Grzegorzewska Academy of Special Education Publishing House, 2021, pp. 274-291.
7. Kamyk-Wawryszuk A., Needs of a rare educational disease of a child with cancer. In: Oncologopedics. Therapy and Practice / ed. Agnieszka Hamerlińska. Bielsko-Biała : Wydawnictwo Medyczne Alfa-Medica Press, 2021, pp. : 51-75
8. Kamyk-Wawryszuk A, Sensory processing disorders in boys of younger school age with Sanfilippo disease and the possibilities of pedagogical and speech therapy support. Case studies, In: Interdisciplinarity in speech therapy: necessity or excess? / ed. Izabela Więcek-Poborczyk, Justyna Żulewska-Wrzosek, Warsaw: Publishing House of the Academy of Special Education, 2020, pp. 205-234.
9. Kamyk-Wawryszuk A, Teaching Strategies for Children Suffering from Rare Diseases and Sensory Hyposensitivity: Teacher Perspectives, The International Journal Of Early Childhood Learning, Vol. 27, iss. 2, pp. 21-34.
10. Kamyk-Wawryszuk A., Educational needs of children with rare diseases and long-term home ventilation (SMARDI) - case study, In: Approaches and Models in Special Education and Rehabilitation : Thematic Collection of International Importance / ed. Goran Nedović, Fadilj Eminović, Belgrade : University of Belgrade, 2020, pp. 173-187.
11. Kamyk-Wawryszuk A., Educational needs of preschool children with recognized rare disease and intellectual disability - teachers• perspective, Journal Plus Education, Vol. 24/2019, Special issue, pp. 8-19.
12. Kamyk-Wawryszuk A., Educational needs of preschool children with non-spontaneous speech development delay and diagnosed rare disease. Case studies of boys with Cri du Chat syndrome and mucopolysaccharidosis type III, Education No. 4 (147)/2018, pp. 108-124.
13. Kamyk-Wawryszuk A., The needs of the family of a child with a rare disease and intellectual disability and the possibilities of support by the local community, Disability. Discourses of Special Education, No. 31/2018, pp. 72-86.
14. Kamyk-Wawryszuk A., Child with mucopolysaccharidosis in kindergarten — the perspective of therapists, Studia Edukacyjne No. 49/2018, pp. 299-314.
15. Kamyk-Wawryszuk A, Preverbal communicative behaviours of children with Cri du Chat syndrome in the assessment of parents, Interdisciplinary Contexts of Special Education, No. 21/2018, pp. 143-166.

**List of patents and protective works:**
lack

**List of active participation in conferences:**

1. Kamyk-Wawryszuk A., Rare disability — an unknown or omitted term?, NATIONAL CONFERENCE "Disability: a task or a challenge in the modern world?", 20 November 2023, UKSW in Warsaw
2. Kamyk-Wawryszuk A, COMMUNICATION BEHAVIOURS OF A CHILD WITH CRI DU CHAT SYNDROME DESCRIBING HIS OR HER PHYSICAL CONDITION IN THE OPINION OF PARENTS, XX National Scientific and Training Conference entitled "60 years of speech therapy in Poland.

History - Present - Perspectives for Development", 02-04.06.2023, Maria Curie-Skłodowska University in Lublin.

3. Kamyk-Wawryszuk A., Difficult situations in the upbringing of a child with a rare disease and addicted in everyday functioning on medical equipment in the family and the possibilities of support, National Scientific Conference from the series Family in theory and pedagogical practice entitled Upbringing in the family - between stability and changeability in the context of contemporary changes On the 25th anniversary of the establishment of the Department of Family Pedagogy at the Institute of Pedagogy of the Catholic University of Lublin, Lublin, 08.06.2022
4. Kamyk-Wawryszuk A, School climate of children with a rare disease and intellectual disability in the opinion of early school education teachers, National Scientific Conference Teacher and his work in the face of contemporary challenges, KUL in Lublin, 14.04.2021, active participation
5. Kamyk-Wawryszuk A, Access to rehabilitation services for children with rare disease and
6. intellectual disability in parents opinion in Poland, The International Scientific and Practical Conference "Special education. Research developments in the field of special pedagogy and psychology", Ministry of Education of The Moscow Region Stale Educational Institution of Higher Education Moscow Stale Regional University (Msou) Faculty of Special Pedagogy And Psychotogy Interregional Union of Defectologists Association of Specialists Working With Children With Disabilities of The Moscow Region, Moscow 18.02.2021, active participation.
7. Kamyk-Wawryszuk A., Rare neoplasms in children and the consequences of their occurrence and treatment in the speech therapy aspect, IX Speech Therapy Conference. Cancer in speech therapy, Nicolaus Copernicus University in Toruń, 17.10.2020, active participation
8. Kamyk-Wawryszuk A., Teaching Strategies for Children Suffering From Rare Diseases and Sensory Hyposensitivity: Teachers' Perspective. The Twenty-seventh International Conference on Learning. University of Valencia, Valencia, Spain, 13-15 July 2020.
9. Kamyk-Wawryszuk A., Sensory sensitivity disorders of a child with sanfilippo disease and the possibilities of pedagogical and speech therapy support. Proposal of Conduct, XVI NATIONAL CONFERENCE ON SPEECH THERAPY INTERDISCIPLINARITY IN SPEECH THERAPY - NECESSITY or EXCESS? APS, Warsaw, 26 - 27.10.2019, active participation
10. Kamyk-Wawryszuk A., From preschooler to student. Transforming or Intensifying the Educational Needs of a Child with Sanfilippo Disease?, International Conference on Special Education in the PERSON series: "Unity in Diversity - the Idea and Reality of 30 Years of Inclusive Education in Poland", APS, Warsaw, 26-27.10.2019, active participation
11. Kamyk-Wawryszuk A., Educational needs of preschool children with recognized rare disease and intellectual disability - teachers• perspective, The 19th Biennial Conference of International Study Association on Teachers and Teaching, "Education beyond the crisis: new skills, children's rights and teaching contexts", Sibiu, Romania, Ist - 5th July 2019, poster 11) Kamyk-Wawryszuk A., Educational needs of children with recognized rare disease and intellectual disability, paper, "Education for all: planning and immediacy in educational practices ", Universitâ degli Studi di Perugia, (Italy, 2019).
12. Kamyk-Wawryszuk A., SWAN (Syndrome without Name) and the educational needs of the child, paper, II Seminar on Rare Diseases in Special Education "Complex communication and educational needs of children with a rare disease", UKW in Bydgoszcz (Bydgoszcz, 09.04.2019).
13. Kamyk-Wawryszuk A, The needs of the family of a child with a rare disease and intellectual disability and the possibilities of support by the local community, poster session, IV Scientific Conference of the series, Pedagogical horizons, From (dis)ability to diversity. In search of optimal solutions in education, rehabilitation and support, (Olsztyn, 5-6.06.2018)

14. Kamyk-Wawryszuk A., Family and friends as a source of support for families of children with a rare disease and intellectual disability, paper, International Family Conference "Capital and deficit of social support. From exclusion to integration", GSW Millenium (Gniezno 14-15.05.2018)

**List of scholarships and scientific internships:**

1. scientific internship Universal Design for Learning and barriers in teaching a child with a rare disease and intellectual disability carried out under the supervision of dr hab. Beata Cytowska, prof. UWr, Head of the Department of Education of Persons with Disabilities at the University of Wrocław

**List of participation in scientific grants:**

1. 2023 - Uralsk, Republic of Kazakhstan (18 October-15 November 2023) visit to Makhambet Utemisov West Kazahstan University as a visiting professor at the invitation of the Ministry of Science and Higher Education of the Republic of Kazakhstan as part of the project "On approval of the plan of distribution of the number of foreign scientists to engage in teaching activities in higher and postgraduate educational institutions".
2. 2023 - Miniature 7, entitled Parental Ways of Coping with the Deterioration of Health of a Child with Mechanical Ventilation (LW) and Rare Disability - Consultation Trip to Trinity College Dublin.
3. 2021 - "Small Grants" competition of the Women in Science Foundation, intended to co-finance the translation of the article "Communication behaviour of children with Cri du Chat syndrome during play"

**Other important academic and professional achievements:**

1. 2022 teaching internship at the University of Sarajevo

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# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Marta Kładź-Kocot

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

Doctor of humanities in the field of literary studies.
Humanities / Literary Studies
Scientific specialty: History of literature, comparative literature

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

1. Rhetoric

The following lists refer to the last 5 years, with particular emphasis on achievements related to classes conducted at the Doctoral School of the Bydgoszcz University of Technology.

**List of doctoral dissertation supervisor functions:**
lack

**List of reviews in the procedure for scientific promotion:**
lack

**List of scientific publications:**

Monograph

1. Two poles of mythopoetics. Archetypal narratives in the works of John Ronald Reuel Tolkien and Stanisław Lem, Epigram, Bydgoszcz 2012.

Publications

1. The Heroes of Dante's "Divine Comedy" and Milton's "Paradise Lost" Between the Circularity and the Linearity of the Road, in: Identity and Splitting, ed. L. Wiśniewska, Bydgoszcz 2002, pp. 139-150.
2. Evaluation and Worthlessness of Worlds in the Work of C.S. Lewis, in: Literature in the Circle of Values, ed. L. Wiśniewska, Bydgoszcz 2003, pp. 165-174.
3. Imram, or longing for paradise. Earendil by J.R.R. Tolkien and The Journey of the "Dawn Treader" by C.S. Lewis, in: Literackie drogi wobec mitu, ed. L. Wiśniewska, Bydgoszcz 2006, pp. 119-126.
4. How the Word Became Flesh. The Cosmogonic Myth in the Works of Stanisław Lem, in: Myths of the Word, Myths of the Body, ed. L. Wiśniewska, M. Gołuński, Bydgoszcz 2007, pp. 131-141
5. Prosper Merimée's Don Juan and Contexts, in: Don Juan in the Transformations of Culture, ed. L. Wiśniewska, Bydgoszcz 2008, pp. 43-56.
6. Duality and Other Problems with the Identity of Stanisław Lem's Heroes, in: Identity and Duality in the Perspective of Myths, ed. L.Wiśniewska, Bydgoszcz2008, pp. 127-138.

7. The Heroic Myth in the Works of J.R.R. Tolkien and Stanisław Lem in a Comparative Approach, in: "Wiek XIX", Rocznik Towarzystwo Literackiego im.
8. Stanisław Lem's ironic world-building. The Myth of Creation from Chaos, "Bez Porównania" 2009 No. 1(7), pp. 121-135.
9. "Silentium Universi" in the Works of Stanisław Lem, in: Silence and Silence. Socio-cultural mechanisms of creating emotions, ed. B. Płonka-Syroka, K. Marchel, Wrocław 2010, pp. 215-224.
10. Odysseus between values. "Song Six" by Ernst Schnabel and "Penelopiada" by Margaret Atwood, in: Transformations of Myths and Values Not Only in Literature, ed. L. Wiśniewska, M. Gołuński, Bydgoszcz 2010, pp. 267-281.
11. Myths in the Works of J.R.R. Tolkien and Stanisław Lem – a Comparative Perspective, in: Comparative Literature Between Mickiewicz and the Present Day, ed. L. Wiśniewska, Bydgoszcz 2010, pp. 225-240.
12. Galadriel, Beatrice and the Holy Grail, or about women in J.R.R. Tolkien's "private mythology", in: Beatrice and others. Myths of Women in Literature and Culture, ed. G. Borkowska, L. Wiśniewska, Gdańsk 2010, pp.77-87.
13. The Boundaries of Literature and Culture in the Perspective of Comparative Interdisciplinary Studies. Myth in Literature, in: Granice kultury, ed. A. Gwóźdź, Śląsk, Katowice 2010, pp. 225-242.
14. Allegory on the side of values – "The Pilgrim's Wandering" by C.S. Lewis, in: Ethical Categories in the Times of the Fall of Spirituality, ed. and introduction by L. Rożek, Częstochowa 2011, pp. 150-170.
15. The Myth of Primordial Language in the Earthsea Cycle by Ursula K. Le Guin, in: Language – Nature – Civilization, ed. E. Laskowska, B. Morzyńska-Wrzosek, W. Czechowski, Bydgoszcz 2012.
16. Image as a myth. Dispersion Experience, in: More than an Image, ed. E. Wilk, A. Nacher, M. Zdrodowska, E. Twardoch, M. Gulik, Wydawnictwo Naukowe Katedra, Gdańsk 2015.
17. Mrs. Moore's shadow. Sexuality, Femininity and Gender Constructions in the Works of C.S. Lewis, "Creatio Fantastica" No. 4 (46) 2014.
18. The spaces of myth in Neil Gaiman's "American Gods". A Comparative Study of Postfigurative Techniques, in: Comparative Mythographic Design. Comparative Studies Between Mickiewicz and the Present Day IV, ed. L. Wiśniewska, Bydgoszcz 2015.
19. J.R.R. Tolkien's Ghastly Symmetries, in: Tolkien. Myth, history, literature. Essays and Studies, ed. Z. Kopeć, P. Matusik, M. Michalski, Poznań 2016.
20. Migrations of post-apocalyptic narratives. Pop Culture as a Source of Suffering, in: Cultures in Motion. Migrations, transfers, epistemologies, eds. R. Koshany, M. Michałowska, J. Ostrowska, A. Skórzyńska, Publishing House of Social Sciences and Humanities of the Adam Mickiewicz University in Poznań, Publishing House of the Humaniora Foundation, Poznań 2019.

**List of patents and protective works:**
lack

**List of active participation in conferences:**
lack

**List of scholarships and scientific internships:**
lack

**List of participation in scientific grants:**
lack

**Other important academic and professional achievements:**
Novels

1. Night of the cat, day of the owl. Volume 1, The Castle of Shadows, Genius Creations, Bydgoszcz 2017.
2. Night of the cat, day of the owl. Volume 2, Clay Seal, Genius Creations, Bydgoszcz 2018.
3. Daraena, Bibliotekarium, Bydgoszcz 2021 (nominated for the Janusz Zajdel Polish Fandom Award).

Stories

1. A Sea of Strange Stories, "Creatio Fantastica" 1 (48) 2015.
2. The Island of Cruel Dreams, "Fenix Anthology" 3 (3) 2018.
3. Effigies, "Fantom" 7/2018.
4. Rocks of the Caucasus, "Nowa Fantastyka" 12 (435) 2018.
5. The Soldier and the Hermit, "Fenix Anthology" 2-3 (6-7) 2019.
6. It is not I who create worlds, in: Dreams of the Dead. Polish weird fiction yearbook 2019.
7. Silver, in: Tarnowskie Góry fantastically 2, Almaz, Tarnowskie Góry 2020.
8. The Anthropologist and His Magic, "Nowa Fantastyka" 3 (462) 2021.
9. And death will lose its power, in: Towards the stars. Anthology of Polish Science Fiction 2021, Polish Science Fiction Foundation, Wydawnictwo IX, Kraków 2021.
10. My Mother Became the Word, "Nowa Fantastyka" 9 (492) 2023.

Other

1. Popular science lectures delivered in cultural centres.
2. Participation in discussion panels, lectures, conducting literary workshops.
3. Online lectures and cyclical podcasts on literature recorded in cooperation with the Kujawsko-Pomorskie Cultural Centre in Bydgoszcz and other centres.
4. Journalistic texts, columns, reviews, including cyclical columns published in the Bydgoszcz Cultural Guide.

Teaching

1. Rhetoric
2. Techniques of writing novels,
3. The culture of the living word with elements of rhetoric,
4. Contemporary culture,
5. Cultural content in the media,
6. History of universal literature,
7. Literary Anthropology,
8. Literary Studies,
9. Comparative Studies,
10. Literary workshops,
11. Art criticism,
12. Drama and bibliotherapy.

Professional experience

1. 2023 - Conducting remote classes in novel writing techniques at the Cardinal Stefan Wyszyński University in Warsaw.
2. 2009 – Bydgoszcz University of Technology (University of Technology and Life Sciences in Bydgoszcz), lecturer at the Pedagogical College, doctoral studies and doctoral school.
3. 2020 – Cooperation with Almaz, Powergraph and SQN publishing houses and others in the field of editing literary texts.
4. 2015 ¬ 2019 Kazimierz Wielki University in Bydgoszcz, lecturer in the field of social rehabilitation.
5. 2014 – 2020 Genius Creations Publishing House, editor, cooperation in the field of publishing fantasy novels.
6. 2013 – 2015 Sole proprietorship, educational company Logoi.
7. 2011 – 2013 I Private High School and I Private Junior High School
8. in Bydgoszcz – Polish language teacher.
9. 2005 – 2010 University of Economy in Bydgoszcz, lecturer in the field of cultural studies.

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# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Magdalena Zając

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

PhD / humanities / pedagogy

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

1. Pedagogical Course

The following lists refer to the last 5 years, with particular emphasis on achievements related to classes conducted at the Doctoral School of the Bydgoszcz University of Technology.

**List of doctoral dissertation supervisor functions:**
lack

**List of reviews in the procedure for scientific promotion:**
lack

**List of scientific publications:**

1. Year: 2023; Authors: Anna Ratajska, Agnieszka Nowakowska-Arendt, Magdalena Zając; Title: Teaching clinical communication skills in postgraduate medical education with particular emphasis on palliative medicine; Source: Palliative Medicine in Practice - 2023, Vol. 17, no 2, pp. 105-110; Conversion score of the Ministry of Science and Higher Education: 100,000; Work affiliated by UKW; DOI: 10.5603/PMPI.a2023.0006
2. Year: 2023; Authors: Sebastian Stec, Antoni Wileczek, Agnieszka Reichert, Janusz Śledź, Jarosław Kosior, Dariusz Jagielski, Anna Polewczyk, Magdalena Zając, Andrzej Kutarski, Dariusz Karbarz, Dorota Zyśko, Łukasz Nowarski, Edyta Stodółkiewicz-Nowarska; Title: Shared Decision Making and Cardioneuroablation Allow Discontinuation of Permanent Pacing in Patients with Vagally Mediated Bradycardia; Source: Journal of Cardiovascular Development and Disease - 2023, Vol. 10, art. no 392; Language of publication: ENG; Conversion score of the Ministry of Science and Higher Education: 2,000; Work affiliated by UKW; DOI: 10.3390/jcdd10090392
3. Year: 2023; Authors: Antoni Wileczek, Edyta Stodółkiewicz-Nowarska, Agnieszka Reichert, Anna Kustroń, Janusz Śledź, Wojciech Biernikiewicz, Bartłomiej Orlik, Michał Lipka, Andrzej Kutarski, Dagmara Hering, Magdalena Zając, Sebastian Stec; Title: Reevaluation of indications for permanent pacemaker implantation after cardioneuroablation; Source: Cardiology Poland - 2023, Vol. 81, iss. 12, pp. 1272-1275; Journal Citation Reports, Impact Factor ISI: 3.700; Conversion score of the Ministry of Science and Higher Education: 100,000; Work affiliated by UKW; DOI: 10.33963/v.kp.97828
4. Year: 2022; Authors: Remigiusz Dróżdż, Marcin Pasek, Magdalena Zając, Mirosława Szark-Eckardt; Title: Physical Culture and Sports as an Educational Basis of Students' Healthy Physical Activities during and Post-Lockdown COVID-19 Restrictions; Source: International Journal of

Environmental Research and Public Health - 2022, Vol. 19, iss. 18, Art. No 11663; Conversion score of the Ministry of Science and Higher Education: 140,000; Work affiliated by UKW; DOI: 10.3390/ijerph191811663

5. Year: 2022; Authors: Bartosz Kozłowski, Joanna Kubiak-Pulkowska, Julianna Pałka, Dominika Bożełow, Magdalena Zając, Aleksander Deptuła; Title: Healthcare-associated infections in COVID-19 ICU patients - two-centre study; Source: Central European Journal of Public Health - 2022, Vol. 30, iss. 3, pp. 196-200; Journal Citation Reports, Impact Factor ISI: 1.200; Conversion score of the Ministry of Science and Higher Education: 16,328; Work affiliated by UKW; DOI: 10.21101/cejph.a7135
6. Year: 2022; Authors: Marcin Pasek, Elena Bendikova, Michalina Kuska, Hanna Żukowska, Remigiusz Dróżdż, Dariusz Jacek Olszewski-Strzyzowski, Magdalena Zając, Mirosława Szark-Eckardt; Title: Environmental Knowledge of Participants' Outdoor and Indoor Physical Education Lessons as an Example of Implementing Sustainable Development Strategies; Source: Sustainability - 2022, Vol. 14, iss. 1, Art. No 544; Journal Citation Reports, Impact Factor ISI: 3.900; Conversion score of the Ministry of Science and Higher Education: 100,000; Work affiliated by UKW; DOI: 10.3390/su14010544
7. Year: 2022; Authors: Kanupriya Rawat, Ryszard Pujszo, Marta Wojdat, Magdalena Zając; Title: A comparative analysis of the sense of optimism and life satisfaction among judo and brasilian jiu jitsu fighters; Source: Journal of Education, Health and Sport - 2022, Vol. 12, no 2, pp. 34-47; p-ISSN: 2391-8306; Conversion score of the Ministry of Science and Higher Education: 20,000; DOI: 10.12775/JEHS.2022.12.02.004
8. Year: 2022; Authors: Sebastian Stec, Beata Jankowska-Polańska, Dariusz Jagielski, Antoni Wileczek, Krystian Josiak, Janusz Śledź, Agnieszka Reichert, Anna Kustroń, Dorota Zyśko, Bartosz Skonieczny, Artur Fedorowski, Anna Ratajska, Magdalena Zając, Dagmara Hering, Wojciech Wąsek, Edyta Stodółkiewicz-Nowarska; Title: Rationale and design of SAN. OK randomized clinical trial and registry: Comparison of the effects of evidence-based pacemaker therapy and cardioneuroablation in sinus node dysfunction; Source: Cardiology Journal - 2022, Vol. 29, no 6, pp. 1031-1036; Language of publication: ENG; Journal Citation Reports, Impact Factor ISI: 2,900; Conversion score of the Ministry of Science and Higher Education: 100,000; Work affiliated by UKW; DOI: 10.5603/CJ.a2022.0103
9. Year: 2021; Authors: Ryszard Pujszo, Magdalena Zając, Grzegorz Przybylski; Title: The efficiency of the respiratory system of men at risk of social exclusion; Source: Journal of Education, Health and Sport - 2021, Vol. 11, no 12, pp. 327-336; Conversion score of the Ministry of Science and Higher Education: 23,096; Work affiliated by UKW; DOI: 10.12775/JEHS.2021.11.12.026
10. Year: 2019; Authors: Beata Wolska, Ryszard Pujszo, Patrycja Janowska, Marta Wojdat, Magdalena Zając, Małgorzata Pujszo; Title: The specificity of motivations in different combat sports and different lengths of the sports career; Source: Baltic Journal of Health and Physical Activity - 2019, Vol. 11, iss. 3, pp. 109-116; Conversion score of the Ministry of Science and Higher Education: 28,574; Work affiliated by UKW
11. DOI: 10.29359/BJHPA.11.3.11

**List of patents and protective works:**
lack

**List of active participation in conferences:**

1. Zając M. "Dyslexia: from brain research to practice" voice in the discussion (organizer: Nencki Institute of Experimental Biology of the Polish Academy of Sciences, Board of the Warsaw Branch No. 1 of the Polish Dyslexia Association, ZG PTD) Warsaw 3-5.09.2004

2. Kurowska K., Zając M., sense of coherence and functioning of the elderly. I International Scientific Conference Education to and in old age Bydgoszcz 18-19.10.2006
3. Kaja, B. Zając, M. (2002, June) Normalization of the B. Kaja & R. Nair Phonological Awareness Test and its Application in the Diagnosis of Dyslexia. Lecture Scientific Seminar "Diagnosis of Dyslexia" (4-5 June 2002, Lubostroń) XII International Congress of the Polish Respiratory Society "Allergology of the 21st century – new challenges, new opportunities" Bydgoszcz 9-12 September 2015poster: Respiratory tract infections and skin lesions as a manifestation of allergic diseases in children
4. Marzena Tutak-Słupska, Radosława Staszak–Kowalska, Ewa Gawrońska-Ukleja, Magdalena Zając, International Conference "SLI – Specific Language Impairment – diagnosis, prognosis, intervention" 5-8 July 2012 Warsaw – Educational Research Institute, language of instruction, International Conference Child language impairment in multilinguals contexts 27-28 May 2013 Krakow
5. Magdalena Zając, IV INTERNATIONAL ADMINISTRATIVE AND TEACHING STAFF TRAINING WEEK Multilingual Universities: Preparing EU Citizens for a Global Society Vigo, Spain 23rd -27th of June 2014 paper: Psychological and linguistic problems of bilingual people(as part of the Erasmus+ programme)

**List of scholarships and scientific internships:**
lack

**List of participation in scientific grants:**
1. co-investigator of the grant "Improving the communication skills of doctors with patients in an innovative way to ensure higher quality of health care, better patient outcomes and reduction of treatment costs" funding: Ministry of Science and Higher Education under the "DIALOG" program 2018-2020 (Dialog 0259/2018 value PLN 223,527)
2. co-contractor of the grant "Food Chain Safety and Personalized Food SafeFoodMed" in the scope of the part entrusted to the Laboratory of Human Motor Diagnosis and Psychological and Pedagogical Aspects (at the Faculty of Physical Culture, Health and Tourism – consortium of UKW, UTP, CM UMK, the total value of the project exceeds PLN 6 million, the value on the part of UKW is PLN 600,000)

**Other important academic and professional achievements:**
Subjects taught so far:
1. Methodology of pedagogical research
2. Methodology of pedagogical research and the basis of statistics
3. Methodology of humanities research
4. Methodology of Psychological Research (theoretical extension course)
5. Methods of pedagogical research
6. Speech therapy
7. Basics of statistics
8. Didactic competence in overcoming reading difficulties
9. Revalidation of children with special educational needs
10. Foster and reconstructed family
11. Selected issues in speech therapy and speech disorders
12. Corrective, compensatory and compensatory classes for children with specific difficulties in reading and writing
13. Diagnosis and therapy of dyslexia

POLITECHNIKA BYDGOSKA
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HR EXCELLENCE IN RESEARCH

# CHARACTERISTICS OF A DOCTORAL SCHOOL LECTURER

**Name:**
Kevin Sompel

**Academic title/field, academic degree/field and discipline, professional title, year of obtaining the academic title/degree/professional title:**

Major: Biomedical Engineering Focus: Cell & Tissue Engineering, Johns Hopkins University, Baltimore MD, Bachelor of Science: May 2021
Minors: Mathematics, Psychology, Johns Hopkins School of Education, Baltimore MD Graduate Non-Degree: May 2024

**List of classes conducted with doctoral students at the Doctoral School of the Bydgoszcz University of Technology:**

1. The English language

The following lists refer to the last 5 years, with particular emphasis on achievements related to classes conducted at the Doctoral School of the Bydgoszcz University of Technology.

**List of doctoral dissertation supervisor functions:**
lack

**List of reviews in the procedure for scientific promotion:**
lack

**List of scientific publications:**

1. Aedla, M., Zhou, A., Sompel, K., Hu, K., Cheng, C., Hsu, J., ... & Weiss, C. R. (2022). A Study of Postoperative Complications Occurring at Home With Pediatric Gastrostomy Feeding Tubes. Journal of pediatric gastroenterology and nutrition, 75(1), 30-35.
2. Aedla, M., Zhou, A., Sompel, K., Hu, K., Zhang, S., Qian, J., ... & Weiss, C. (2021). S1288 Varying and Prevalent Complications Associated With Pediatric Gastrostomy Tubes. Official journal of the American College of Gastroenterology| ACG, 116, S592.
3. Liang, J. A., Sompel, K., Yu, J. K., Mesquita, T., Marban, E., Cingolani, E., & Trayanova, N. (2020). Reversing Membrane Clock Remodeling (MCR) Associated With Heart Failure With Preserved Ejection Fraction (HFpEF) in the Sinoatrial Node (SAN) Eliminates Chronotropic Incompetence (CI). Circulation, 142(Suppl_3), A17006-A17006.

**List of patents and protective works:**
lack

**List of active participation in conferences:**
lack

**List of scholarships and scientific internships:**
lack

**List of participation in scientific grants:**
lack

**Other important academic and professional achievements:**
Professional experience
Teach For America – Secondary Math Teacher, *Washington D.C. May 2022–Present*
• Teach 10th grade geometry to 78 students at Columbia Heights Educational Campus
• Develop daily lesson plans and unit plans based on Universal Design of Learning (UDL) principles and aligned to Common CORE State Standards
• Construct learning environment system and procedures rooted in social-emotional competencies and trauma informed practices
• Organized daily 1-on-1 mentoring check-ins with students, supporting them in achieving self-made goals
Fulbright English Teaching Assistant, *Bydgoszcz, Poland Sept. 2021–Jun. 2022*
• Instructed 8 university classes over 15 weeks of conversation-based, STEM focused English lessons
• Formulated original lesson plans special tailored to the needs of students
• Hosted frequent informational discussions about U.S. life for students from the elementary to the university level
Department of Biomedical Engineering, Teaching Assistant, *Baltimore, MD Oct. 2020-Dec. 2020*
• Held weekly extended office hours for students seeking assistance, often balancing time between 6+ students at once
Department of Applied Mathematics and Statistics, Head Teaching Assistant, *Baltimore, MD Aug. 2019-May 2021*
• Taught weekly recitation sessions for 25 students, reviewing course content learned during lectures
• Created formula sheets and practice problem sets containing over 150 probability and statistics questions
• Implemented a novel online Q&A platform to promote inclusivity of international students during virtual
instruction
• Managed 13 Teaching Assistants, monitoring grading schedules, exam proctoring, and teaching effectiveness
Office of Academic Support, PILOT Advisory Board & Peer Mentor, *Baltimore, MD Aug. 2018-May 2021*
• Mentored 10 first-year students weekly in Physics and transitioning to college life
• Trained 150+ peer mentors each semester on how to build community and promote diversity

Research experience
Research Assistant, Trayanova Lab, *Baltimore, MD Feb. 2019-Sept. 2020*
• Collaborated with clinicians from the *SMIDT Heart Institute* to explore the underlying mechanisms behind exercise-intolerance in patients with heart failure
• Developed code in MATLAB and Python to modify biophysically-detailed models of the sinoatrial node
• Critically reviewed and presented published, peer-reviewed articles at internal lab meetings
Biomedical Engineering Design Team, *Baltimore, MD Mar. 2019-Jul. 2021*
• Designed a feeding tube which improved pediatric gastric enteral access by reducing the frequency of tube displacement
• Controlled the development of over 10 benchtop-tests to test product usability and efficiency
• Presented findings and updates at bi-weekly meetings to faculty advisors and the director of interventional radiology at Children's National in Washington D.C
• Led a week-long social media campaign resulting in a $10,000 top prize finish

Clinical experience

Emergency Department Volunteer, The Johns Hopkins Hospital, *Baltimore, MD (90 hours) Jun. 2019-Mar. 2020*

• Enhanced patient interaction skills by surveying residing patients for departmental feedback on their hospital stay

• Regularly observed high-pressure situations such as trauma care procedures

General Cardiology Observer, The Johns Hopkins Hospital, *Baltimore MD (30 hours) Jul. 2019*

• Developed a better understanding of provider-patient interaction by observing healthcare professionals discuss
treatment plans and diagnoses with patients

• Perceived the integration between clinical research, technology, and healthcare through structured daily discussions with clinicians on published articles relating to modern-day developments in imaging and diagnosis

Community service experience

One Tent Health, Volunteer, *Washington, D.C. (20 hours)Aug. 2022-Present*

• Administer free HIV and COVID-19 testing to underserved, at-risk communities in the D.C. area

• Advise patients and connect them with clinicians to discuss prophylactic and reactive measures

Illinois Leadership Seminars, Director of Technology, *Chicago, IL Jun. 2015-Present*

• Enhanced and developed leadership in 100 high school student leaders over yearly 3-day seminar

• Coached 16 students directly, leading them through activities and facilitating discussions

• Spearheaded the transition to the organizations first virtual seminar, planned for June 2021

BME Design Lab – Mask 3D Printing Volunteer, *Baltimore, MD May. 2020-Jun. 2020*

• Assisted in the printing, processing, and delivery of 3D printed adjustable mask straps or clinicians at a nearby hospital during the height of the COVID-19 pandemic for Johns Hopkins Hospital healthcare workers

Other experience

Women Mentoring Whiting, Co-founder, *Baltimore, MD Feb. 2020-May. 2021*

• Co-developed a year-long mentorship organization to increase retention of women in the engineering field

• Created a pilot program, planned frequent events, and coordinated with faculty from the school of education to conduct an IRB-approved study

• Narrowed 100+ applicants into 14 mentorship pairs spanning from undergraduate to PhD level students

Notes of Ranvier, Secretary, *Baltimore MD Sept. 2017-May 2021*

• Served the community through music; performing in children's hospitals, veteran's homes, and religious services

• Rehearsed musical pieces for upwards of 6 hrs/week

• Contacted local businesses for a benefit concert that raised over $2000 for a local after school program, *Child*
*First Authority, Inc.*

Massachusetts Institute of Technology: HSSP, Volunteer Teacher, *Virtual Jul. 2020–Aug. 2020*

• Formed and taught an interactive 6-week course on social psychology to high school students across the U.S. Count Me In - Global Student Leadership Summit, Volunteer, *Virtual Aug. 2019-May 2020*

Professional associations

Tau Beta Pi, Engineering Honors Society *May 2020-Present*

Alpha Eta Mu Beta, National Biomedical Engineering Honors Society *Nov. 2019-Present*

• Founded a tutoring service for 2nd year Biomedical Engineers, supporting 150+ students and 6 courses

Honors, awards, & grants

Johns Hopkins University Dean's List, 7 semesters of 7 possible *Aug. 2017-May 2021*
Fulbright Poland - English Teaching Assistant Grant, Finalist ($11, 800) *Feb. 2021*
2020 Hopkins Biotech Network BioPitch Competition, 1st Place Winner *Nov. 2020*
2020 MedTech Innovator/NCC-PDI Pediatric Medical Device Pitch Competition, Semi-Finalist *Sept. 2020*
Fall 2020 Johns Hopkins University NSF I-Corps Grant Winner *Fall 2020*
2020 UC Davis Big Bang! Business Plan Competition
• People's Choice Award ($10,000) *May 2020*
• Food Agriculture & Health Innovation Award ($3,000)
Induction into National Engineering Honors Society *May 2020*
2020 Johns Hopkins University Business Plan Competition, Finalist *Apr. 2020*
2020 Rice 360o Undergraduate Global Health Technologies Design Competition, Semi-Finalist *Mar. 2020*
Provost's Undergraduate Research Award ($4,000) *Mar. 2020*
Induction into National Biomedical Engineers Honors Society *Nov. 2019*

Skills & certifications

TESOL Certification *Aug. 2021*

POLITECHNIKA BYDGOSKA
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# CRITERION 4

## Quality of the recruitment process

# Composition of the Recruitment Committees

Uniwersytet Technologiczno-Przyrodniczy
im. Jana i Jędrzeja Śniadeckich w Bydgoszczy

# ORDINANCE No. Z.5.2019.2020

**Rector of the UTP University of Science and Technology in Bydgoszcz**

of 23 September 2019

on **appointment of the Recruitment Committee of the Doctoral School of the UTP University of Science and Technology in Bydgoszcz for the academic year 2019/2020**

Pursuant to Article 23(1) and (2)(2) of the Act of 20 July 2018 Law on Higher Education and Science (Journal of Laws of 2018, item 1668, as amended), § 37 (2) and (4)(4) of the Statute of the University in conjunction with Article 227(3) of the Act of 3 July 2018 Provisions introducing the Act – Law on Higher Education and Science and point IV.1 and point IV.2 of the " Terms of admission of candidates for the first academic year of the Doctoral School in the academic year of 2019/2020" constituting an attachment to the Senate's Resolution No. 9/428 of 22 May 2019.

**I manage**, the following:

**§ 1**

I hereby appoint the Recruitment Committee of the Doctoral School of UTP University of Science and Technology in Bydgoszcz for the academic year 2019/2020, composed of:

1) Dariusz Skibicki, PhD, DSc, Eng., Associate Professor – chairman;
2) Prof. Maria Siwek-Gapińska – Deputy Chairman;
3) Prof. Janusz Sempruch, PhD, DSc;
4) Grzegorz Lemańczyk, PhD, DSc, Eng., Associate Professor
5) Ireneusz Grubecki, PhD, DSc, Eng., Associate Professor;
6) Maciej Walkowiak, PhD, DSc, Eng., Associate Professor;
7) Mateusz Nowakowski, M.A. – as an observer as a representative of the doctoral students' self-government.

**§ 2**

The ordinance enters into force on the date of signing.

**R E C T O R**

Prof. Tomasz TOPOLIŃSKI

Uniwersytet Technologiczno-Przyrodniczy
im. Jana i Jędrzeja Śniadeckich w Bydgoszczy

# ORDINANCE No. Z.150.2019.2020

**Rector of the UTP University of Science and Technology in Bydgoszcz**

of 28 May 2020

on **appointment of the Recruitment Committee of the Doctoral School of the UTP University of Science and Technology in Bydgoszcz for the academic year 2020/2021**

Pursuant to Article 23(1) and (2)(2) of the Act of 20 July 2018 Law on Higher Education and Science (Journal of Laws of 2020, item 85, as amended), § 37 of the Statute of the UTP University of Science and Technology in Bydgoszcz and § 5 (1) of the " Terms of admission of candidates for the first academic year of the Doctoral School in the academic year 2020/2021" constituting an attachment to the Senate Resolution No. 2/440 of 18 March 2020.

**I manage**, the following:

**§ 1**

I hereby appoint the Recruitment Committee of the Doctoral School of UTP University of Science and Technology in Bydgoszcz for the academic year 2020/2021, composed of:

1) Professor Dariusz Skibicki – Chairman;
2) Professor Maria Siwek-Gapińska – Deputy Chairman;
3) Professor Janusz Sempruch, PhD, DSc;
4) Professor Anna Wenda-Piesik, PhD, DSc;
5) Beata Jędrzejewska, PhD, DSc, Eng., Associate Professor;
6) Maciej Walkowiak, PhD, DSc, Eng., Associate Professor;
7) Mateusz Nowakowski, MA – as an observer as a representative of the doctoral students' self-government.

**§ 2**

The ordinance enters into force on the date of signing.

**P.P. RECTOR**
**Vice-Rector for science**

Stanisław Mroziński, PhD, DSc, Eng.,
Associate Professor

Uniwersytet Technologiczno-Przyrodniczy
im. Jana i Jędrzeja Śniadeckich w Bydgoszczy

# ORDINANCE No. Z.64.2020.2021

**Rector of the UTP University of Science and Technology in Bydgoszcz**

of 23 November 2020

on **appointment of the Recruitment Committee of the Doctoral School of the UTP University of Science and Technology in Bydgoszcz as part of the supplementary recruitment for the academic year 2020/2021**

Pursuant to Article 23(1) and (2)(2) of the Act of 20 July 2018 Law on Higher Education and Science (Journal of Laws of 2020, item 85, as amended), § 37 of the Statute of the UTP University of Science and Technology in Bydgoszcz and § 5 (1) in conjunction with § 8 (4) of the "Terms of admission of candidates for the first academic year of the Doctoral School in the academic year 2020/2021" constituting an attachment to the Senate Resolution No. 2/440 of 18 March 2020

**I manage**, the following:

**§ 1**

I hereby appoint the Recruitment Committee of the Doctoral School of the UTP University of Science and Technology in Bydgoszcz as part of the supplementary recruitment for the academic year 2020/2021 composed of:

1) Professor Dariusz Skibicki – Chairman;
2) Katarzyna Stadnicka, PhD, DSc, Eng., Associate Professor;
3) Ewa Grochowska, PhD, DSc, Eng., Associate Professor;
4) Patrycja Reszka, M.Sc., Eng. – without the right to vote as an observer as a representative of the doctoral students' self-government.

**§ 2**

The ordinance enters into force on the date of signing.

**RECTOR**

Professor Marek ADAMSKI

Uniwersytet Technologiczno-Przyrodniczy
im. Jana i Jędrzeja Śniadeckich w Bydgoszczy

**ORDINANCE No. Z.190.2020.2021**
**Rector of the UTP University of Science and Technology in Bydgoszcz**
of 21 July 2021

**on the appointment of the Doctoral School Recruitment Committee**

Pursuant to Article 23(1) and (2)(2) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2021, items 478 and 619) and § 5(1) of the Annex to the Senate's Resolution No. 1/453 of 20 January 2021 on the adoption of the Terms of admission of candidates for the first academic year of the Doctoral School in the academic year of 2021/2022

**I hereby order as** follows:

**§ 1**

I hereby appoint the Doctoral School Recruitment Committee for the academic year 2021/2022 composed of:

1) Professor Dariusz Skibicki – representative of the discipline "mechanical engineering" / chairman of the Committee;
2) Professor Maria Siwek-Gapińska – representative of the discipline "animal science and fisheries" / deputy chairman;
3) Professor Anna Wenda-Piesik – representative of the discipline "agriculture and horticulture";
4) Maciej Dutkiewicz, PhD, DSc, Eng. – representative of the discipline "civil engineering and transport";
5) Janina Kabatc, PhD, DSc, Eng. – representative of the discipline of "chemical sciences";
6) Rafał Długosz, PhD, DSc, Eng. – representative of the disciplines of "automation, electronics and electrical engineering" and " information and communication technology".

**§ 2**

The tasks of the committee are specified in § 5 section 3 of the annex to the Senate's Resolution No. 1/453 of 20 January 2021 on the adoption of the Terms of admission of candidates for the first academic year of the Doctoral School in the academic year of 2021/2022.

**§ 3**

A representative of the doctoral students' self-government may participate (without the right to vote) in the work of the Commission as an observer.

**§ 4**

The ordinance enters into force on the date of signing.

**RECTOR**

Professor Marek Adamski

POLITECHNIKA
BYDGOSKA
im. Jana i Jędrzeja Śniadeckich

# ORDINANCE No. Z.158.2021.2022

**Rector of the Bydgoszcz University of Science and Technology**

of 30 June 2022

**on the appointment of the Doctoral School Recruitment Committee**

Pursuant to Article 23(1) and (2)(2) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2022, item 574, as amended[1]) § 4(1) of the Annex to the Senate's Resolution No. 6/466 of 15 December 2021 on: adoption of the Principles of admitting candidates for the first year of education to the Doctoral School of Bydgoszcz University of Science and Technology and § 123 (1) of the Statute of the Bydgoszcz University of Science and Technology[2], the following is ordered:

**§ 1.** The Doctoral School Recruitment Committee, hereinafter referred to as the "Committee" for the academic year 2022/2023, is hereby appointed, composed of:

1) Prof. Dariusz Skibicki – representative of the discipline of mechanical engineering, chairman of the committee;
2) Professor Maria Siwek-Gapińska – representative of the discipline of animal science and fisheries, deputy chairman;
3) Professor Anna Wenda-Piesik – representative of the discipline of agriculture and horticulture;
4) Professor Leszek Szychta – representative of the discipline of automation, electronic and electrical engineering;
5) Rafał Długosz, PhD, DSc, Eng., Associate Professor – representative of the discipline of information and communication technology;
6) Maciej Dutkiewicz, PhD, DSc, Eng., Associate Professor – representative of the discipline of civil engineering and transport;

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[1] Amendments to the Act were published in the Journal of Laws of 2022, items 583, 655, 682, 807, 1010, 1079 and 1117.

[2] The Statute of the Bydgoszcz University of Technology introduced by the Senate's Resolution No. 1/430 of 26 June 2019, amended by the Senate's Resolution No. 6/456 of 24 March 2021, Senate's Resolution No. 5/459 of 23 June 2021 and Senate's Resolution No. 1/460 of 14 July 2021.

7) Janina Kabatc-Borcz, PhD, DSc, Eng., Associate Professor – representative of the discipline of chemical sciences.

**§ 2.** The tasks of the Commission are specified in § 4 section 4 of the annex to the Senate Resolution No. 6/466 of the Jan and Jędrzej Śniadecki Bydgoszcz University of Science and Technology of 15 December 2021 on the adoption of the Principles of admitting candidates for the first year of education to the Doctoral School of Bydgoszcz University of Science and Technology.

**§ 3.** A representative of the doctoral students' self-government may participate in the work of the Commission as an observer (without the right to vote).

**§ 4.** The ordinance enters into force on the date of signing.

**RECTOR**

Professor Marek ADAMSKI

POLITECHNIKA
BYDGOSKA
im. Jana i Jędrzeja Śniadeckich

# ORDINANCE No. Z.118.2022.2023

**Rector of the Bydgoszcz University of Science and Technology**

of 25 May 2023

**amending the ordinance on the appointment of the Doctoral School Recruitment Committee**

Pursuant to Article 23(1) and (2)(2) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2023, item 742), § 4(1) of the Annex to the Senate's Resolution No. 6/466 of 15 December 2021 on: the adoption of the Principles of admitting candidates for the first year of education to the Doctoral School of Bydgoszcz University of Science and Technology and § 123(1) of the Statute of the Bydgoszcz University of Science and Technology[1)], the following is ordered:

**§ 1.** In the Ordinance No. Z.158.2021.2022 of June 30, 2022 on the appointment of the Doctoral School Recruitment Committee in § 1:

1) point 4 is replaced by the following:
   „4) Professor Leszek Szychta – representative of the discipline of automation, electronic, electrical engineering and space technologies;";
2) point 6 is replaced by the following:
   „6) Małgorzata Krajewska, PhD, DSc, Eng., Associate Professor – representative of the discipline of civil engineering, geodesy and transport;".

**§ 2.** The ordinance enters into force on the date of signing.

**RECTOR**

Professor Marek ADAMSKI

[1)] The Statute of the Bydgoszcz University of Technology introduced by the Senate's Resolution No. 1/430 of 26 June 2019, amended by the Senate's Resolution No. 6/456 of 24 March 2021, Senate's Resolution No. 5/459 of 23 June 2021 and Senate's Resolution No. 1/460 of 14 July 2021.

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# ORDINANCE No. Z.133.2022.2023

**Rector of the Bydgoszcz University of Science and Technology**

of 14 June 2023

**on the Doctoral School Recruitment Committee for the academic year 2023/2024**

Pursuant to Article 23(1) and (2)(2) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2023, item 742) and § 4(1) of the Annex to the Senate's Resolution No. 6/466 of 15 December 2021 on the adoption of the Principles of admitting candidates for the first year of education to the Doctoral School of Bydgoszcz University of Science and Technology, hereinafter referred to as the "Principles", it is hereby ordered to, as follows:

**§ 1.** Doctoral School Recruitment Committee, hereinafter referred to as the "Committee" for the academic year 2023/2024, is hereby appointed, composed of:

1) Professor Dariusz Skibicki – as a representative of the discipline of mechanical engineering, chairman of the committee;
2) Professor Maria Siwek-Gapińska – as a representative of the discipline of animal science and fisheries, deputy chairman;
3) Professor Waldemar Iwanek – as a representative of the discipline of chemical sciences,
4) Professor Leszek Szychta – as a representative of the discipline of automation, electronics, electrical engineering and space technologies;
5) Tomasz Talaśka, PhD, DSc, Eng., Professor of PBŚ – as a representative of the discipline of information and communication technology;
6) Maciej Dutkiewicz, PhD, DSc, Eng., Associate Professor – as a representative of the discipline of civil engineering, geodesy and transport;
7) Professor Dariusz Piesik – as a representative of the discipline of agriculture and horticulture.

**§ 2.** The tasks of the Committee are specified in § 4 section 4 of the Annex to the Senate's Resolution No. 6/466 of 15 December 2021 on the adoption of the Principles for the admission

of candidates for the first year of education to the Doctoral School of the Bydgoszcz University of Science and Technology.

**§ 3.** A representative of the doctoral students' self-government may participate in the work of the Commission as an observer without the right to vote.

**§ 4.** The ordinance enters into force on the date of signing.

**RECTOR**

Professor Marek ADAMSKI

POLITECHNIKA
BYDGOSKA
im. Jana i Jędrzeja Śniadeckich

# ORDINANCE No. Z.103.2023.2024

**Rector of the Bydgoszcz University of Science and Technology**

of 25 March 2024

**amending the ordinance on the appointment of the Doctoral School Recruitment Committee for the academic year 2023/2024**

Pursuant to Article 23(1) and (2)(2) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2023, item 742, as amended[1)]), § 4(1) of the Annex to the Senate's Resolution No. 6/466 of 15 December 2021 on the adoption of the Principles of admitting candidates for the first year of education to the Doctoral School of Bydgoszcz University of Science and Technology and § 123(1) of the Statute of the Bydgoszcz University of Science and Technology[2),] the following is ordered:

**§ 1.** In the Ordinance No. Z.133.2022.2023 of June 14, 2023 on the appointment of the Doctoral School Recruitment Committee for the academic year 2023/2024, in § 1 in point 6, the words "Maciej Dutkiewicz" are replaced by the words "Małgorzata Krajewska".

**§ 2.** The ordinance enters into force on the date of signing.

**RECTOR**

Professor Marek ADAMSKI

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1) Amendments published in the OJ of 2023 item1088, 1234, 1672, 1872 and 2005 and of 2024, items 124 and 227.

2) Statute of Bydgoszcz University of Science and Technology implemented by Senate Resolution No. 1/430 of 26 June 2019, amended by Senate Resolution No. 6/456 of 24 March 2021, Senate Resolution No. 5/459 of 23 June 2021, Senate Resolution No. 1/460 of 14 July 2021, 16/481 of 24 May 2023 and 4/486 of 25 October 2023.

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# ORDINANCE No. Z.157.2023.2024

**Rector of the Bydgoszcz University of Science and Technology**

of 6 August 2024

**on the Recruitment Committee of the PBS Doctoral School for the academic year 2024/2025**

Pursuant to Article 23(1) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2023, item 742, as amended[1)]) and § 4(1) of the Annex to the Senate's Resolution No. 6/466 of 15 December 2021 on the adoption of the Principles of admitting candidates for the first year of education to the Doctoral School of Bydgoszcz University of Science and Technology, it is hereby ordered, as follows:

**§ 1.** The Doctoral School Recruitment Committee, hereinafter referred to as the "Committee", for the academic year 2024/2025, is hereby appointed in the following composition:

1) Professor Dariusz Skibicki – as a representative of the discipline of mechanical engineering, chairman of the committee;
2) Professor Maria Siwek-Gapińska – as a representative of the discipline of animal science and fisheries, deputy chairman;
3) Professor Leszek Szychta – as a representative of the discipline of automation, electronics, electrical engineering and space technologies;
4) Tomasz Talaśka, PhD, DSc, Eng., Associate Professor – as a representative of the discipline of information and communication technology;
5) Wirginia Tomczak, PhD, DSc, Eng. – as a representative of the discipline of chemical engineering;
6) Maciej Dutkiewicz, PhD, DSc, Eng., Associate Professor – as a representative of the discipline of civil engineering, geodesy and transport;
7) Professor Oleksandr Shyichuk – as a representative of the discipline of chemical sciences;

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[1)] Amendments to the consolidated text of this Act were announced in the Journal of Laws of 2023, items 1088, 1234, 1672, 1872, 2005 and of 2024, items 124, 227 and 1089.

8) Grażyna Voss, PhD, DSc, Associate Professor – as a representative of the discipline of management and quality studies;
9) Professor Dariusz Piesik – as a representative of the discipline of agriculture and horticulture.

**§ 2.** The tasks of the Commission are specified in § 4 section 4 of the Annex to the Senate's Resolution No. 6/466 of 15 December 2021 on the adoption of the Principles.

**§ 3.** A representative of the doctoral students' self-government may participate in the work of the Commission as an observer without the right to vote.

**§ 4.** The order is valid until 30 September 2025.

**§ 5.** The ordinance enters into force on the date of signing.

**RECTOR**

Professor Marek ADAMSKI

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im. Jana i Jędrzeja Śniadeckich

# ORDINANCE No. Z.43.2024.2025

**Rector of the Bydgoszcz University of Technology**

**Jan and Jędrzej Śniadecki**

of 15 January 2025

**amending the Ordinance on the Admission Committee of the Doctoral School for the academic year 2024/2025**

Pursuant to Article 23(1) and (2)(2) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2024, items 1571, 1871 and 1897), § 4 (1) of the Annex to the Senate's Resolution No. 6/466 of 15 December 2021 on the adoption of the Principles of admitting candidates for the first year of education to the Doctoral School of Bydgoszcz University of Science and Technology and § 123 (1) of the Statute of the Bydgoszcz University of Science and Technology [1)], the following is ordered:

**§ 1.** In the Ordinance No. Z.157.2023.2024 of 6 August 2024 on the appointment of the Doctoral School Recruitment Committee for the academic year 2024/2025, in § 1 point 6, the words "Maciej Dutkiewicz" are replaced by the words "Małgorzata Krajewska".

**§ 2.** The ordinance enters into force on the date of signing.

**RECTOR**

Professor Marek ADAMSKI

[1)] Statute of Bydgoszcz University of Science and Technology introduced by Senate Resolution No. 1/430 of 26 June 2019, amended by Senate Resolution No. 6/456 of 24 March 2021, Senate Resolution No. 5/459 of 23 June 2021, Senate Resolution No. 1/460 of 14 July 2021, Senate Resolution No. 16/481 of 24 May 2023, Senate Resolution No. 4/486 of 25 October 2023 and Senate Resolution No. 6/496 of 25 September 2024.

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im. Jana i Jędrzeja Śniadeckich

# ORDINANCE No. Z.113.2024.2025

**Rector of the Bydgoszcz University of Science and Technology**

of 7 May 2025

**on the Doctoral School Recruitment Committee for the academic year 2025/2026**

Pursuant to Article 23(1) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2024, items 1571, 1871 and 1897) and § 4(1) of the Annex to the Senate's Resolution No. 6/466 of 15 December 2021 on the adoption of the Principles of admitting candidates for the first year of education to the Doctoral School of Bydgoszcz University of Science and Technology, it is hereby ordered, as follows:

**§ 1.** The Doctoral School Recruitment Committee, hereinafter referred to as the "Committee", for the academic year 2025/2026, is hereby appointed, composed of:

1) Prof. Dariusz Skibicki – as a representative of the discipline of mechanical engineering, chairman of the committee;
2) Prof. Maria Siwek-Gapińska – as a representative of the discipline of animal science and fisheries, Deputy Chairman;
3) Prof. Leszek Szychta – as a representative of the discipline of automation, electronics, electrical engineering and space technologies;
4) Rafał Kozik, PhD, DSc, Eng., Associate Professor – as a representative of the discipline of information and communication technology;
5) Wirginia Tomczak, PhD, DSc, Eng., Associate Professor – as a representative of the discipline of chemical engineering;
6) Małgorzata Krajewska, PhD, DSc, Eng., Associate Professor – as a representative of the discipline of civil engineering, geodesy and transport;
7) Prof. Oleksandr Shyichuk – as a representative of the discipline of chemical sciences;
8) Grażyna Voss, PhD, DSc, Associate Professor – as a representative of the discipline of management and quality stidies;
9) Prof. Dariusz Piesik – as a representative of the discipline of agriculture and horticulture.

**§ 2.** The tasks of the Committee are specified in § 4 section 4 of the Annex to the Senate's Resolution No. 6/466 of 15 December 2021 on the adoption of the Principles of admitting candidates for the first year of education to the Doctoral School of Bydgoszcz University of Science and Technology.

**§ 3.** A representative of the doctoral students' self-government may participate in the work of the Commission as an observer without the right to vote.

**§ 4.** The order is valid until 30 September 2026.

**§ 5.** The ordinance enters into force on the date of signing.

**RECTOR**

Professor Marek ADAMSKI, PhD, DSc, Eng.

POLITECHNIKA
BYDGOSKA
im. Jana i Jędrzeja Śniadeckich

# ORDINANCE No. Z.117.2024.2025

**Rector of the Bydgoszcz University of Science and Technology**

of 27 May 2025

**amending the Ordinance on the Admission Committee of the Doctoral School for the academic year 2025/2026**

Pursuant to Article 23(1) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2024, item 1571, as amended) and § 4(1) of the Annex to the Senate's Resolution No. 6/466 of 15 December 2021 on the adoption of the Principles of admitting candidates for the first year of education to the Doctoral School of Bydgoszcz University of Science and Technology, it is hereby ordered, as follows:

**§ 1.** In the Ordinance No. Z.113.2024.2025 of 7 May 2025 on the Doctoral School Admissions Committee for the academic year 2025/2026, § 1 is amended as follows:

1) point 2 is replaced by the following:

„2) Jakub Biesek, PhD, DSc, Eng., Associate Professor – as a representative of the discipline of animal science and fisheries;";

2) point 3 is deleted.

**§ 2.** The ordinance enters into force on the date of signing.

**RECTOR**

Professor Marek ADAMSKI

[1)] Amendments to the consolidated text of the above-mentioned Act were announced in the Journal of Laws of 2024, items 1871 and 1897, and of 2025, items 619, 620, 621 and 622.

Consolidated text prepared by on the basis of Z.117.2024.2025

POLITECHNIKA BYDGOSKA
im. Jana i Jędrzeja Śniadeckich

# ORDINANCE No. Z.113.2024.2025

**Rector of the Bydgoszcz University of Science and Technology**

of 7 May 2025

**on the Doctoral School Recruitment Committee for the academic year 2025/2026**

Pursuant to Article 23(1) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2024, items 1571, 1871 and 1897) and § 4(1) of the Annex to the Senate's Resolution No. 6/466 of 15 December 2021 on the adoption of the Principles of admitting candidates for the first year of education to the Doctoral School of Bydgoszcz University of Science and Technology, it is hereby ordered, as follows:

**§ 1.** The Doctoral School Recruitment Committee, hereinafter referred to as the "Committee", for the academic year 2025/2026, is hereby appointed, composed of:

1) Prof. Dariusz Skibicki – as a representative of the discipline of mechanical engineering, chairman of the committee;
2) Jakub Biesek, PhD, DSc, Eng., Associate Professor – as a representative of the discipline of animal science and fisheries;
3) (repealed);
4) Rafał Kozik, PhD, DSc, Eng., Associate Professor – as a representative of the discipline of information and communication technology;
5) Wirginia Tomczak, PhD, DSc, Eng., Associate Professor – as a representative of the discipline of chemical engineering;
6) Małgorzata Krajewska, PhD, DSc, Eng., Associate Professor – as a representative of the discipline of civil engineering, geodesy and transport;
7) Prof. Oleksandr Shyichuk – as a representative of the discipline of chemical sciences;
8) Grażyna Voss, PhD, DSc, Associate Professor – as a representative of the discipline of management and quality studies;
9) Prof. Dariusz Piesik – as a representative of the discipline of agriculture and horticulture.

**§ 2.** The tasks of the Committee are specified in § 4 section 4 of the Annex to the Senate's Resolution No. 6/466 of 15 December 2021 on the adoption of the Principles of admitting

candidates for the first year of education to the Doctoral School of Bydgoszcz University of Science and Technology.

**§ 3.** A representative of the doctoral students' self-government may participate in the work of the Commission as an observer without the right to vote.

**§ 4.** The order is valid until 30 September 2026.

**§ 5.** The ordinance enters into force on the date of signing.

**RECTOR**

Professor Marek ADAMSKI

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# CRITERION 4

## Quality of the recruitment process

# Regulations of the Doctoral school

# Resolution No. 8/428 of the Senate of the UTP University of Science and Technology in Bydgoszcz of 22 May 2019

on the adoption of the Regulations of the Doctoral School of the UTP University of Science and Technology in Bydgoszcz

Pursuant to Article 292 of the Act of 3 July 201, 8 provisions introducing the Act — Law on Higher Education and Science (Journal of Laws of 2018, item 1669, as amended)

The Senate of the UTP University of Science and Technology in Bydgoszcz states the following:

The Regulations of the Doctoral School of the UTP University of Science and Technology in Bydgoszcz are hereby adopted, constituting an annex to the resolution.

The resolution enters into force at the beginning of the academic year 2019/2020.

**UTP**

**University of Science and**

**Technology in Bydgoszcz**

# REGULATIONS OF THE DOCTORAL SCHOOL

Bydgoszcz 2019

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# GENERAL

§ 1

1. The Regulations of the Doctoral School of Engineering, Technology and Agricultural Sciences, hereinafter referred to as the "Regulations" at the J.J. Śniadecki University of Technology and Life Sciences in Bydgoszcz, hereinafter referred to as the University, define the mode and organization of education at the Doctoral School and the related rights and obligations of doctoral students.
2. The Doctoral School provides education in scientific disciplines in which the university is authorized to award doctoral degrees.
3. The administrative seat of the Doctoral School is the Dean's Office of the Faculty of Mechanical Engineering.
4. The Regulations enter into force on the day of their adoption with effect from
   1 October 2019.
5. Explanation of terms used in the Terms and Conditions:
   1 PhD student – a person undergoing education at the Doctoral School as a young scientist within the meaning of Article 360(2)(1) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2018, item 1668).
   2 Learning outcomes at the Doctoral School – learning outcomes defined at level 8. Polish Qualifications Framework.
   3 Electronic Study Service System – an IT system in force at the University, in which information related to the course of the doctoral student's studies is recorded and stored in electronic form,
   4 Form of didactic classes – lectures, auditorium exercises, foreign language courses.
   5 Scientist ID – an alphanumeric code ORCID (Open Researcher and Contributor ID) created to uniquely identify authors and
   co-authors of scientific and academic publications
   6 Matriculation – the act of admission to the ranks of doctoral students of the university,
   7 Individual research plan – a plan containing a schedule for the preparation of the doctoral dissertation with an indication of the deadline for submitting the doctoral dissertation.
   8 Qualifications – learning outcomes certified by a diploma issued by an authorised institution, confirming the achievement of the assumed learning outcomes.
   9 Identity card – a document confirming the status of a doctoral student,
   10 Professional practice – practice in the form of conducting classes or participating in conducting them, in the amount not exceeding 60 teaching hours per year.

11 Curriculum – a description of the learning process leading to the achievement of the assumed learning outcomes, including the study plan and syllabi along with the methods of verifying the learning outcomes achieved by doctoral students.

12 Full-time form of studies – a form of study in which more than half of the study programme requires the presence of a participant in the organisational unit conducting them and is carried out in the form of didactic classes and scientific work requiring the direct participation of academic teachers or scientific supervisors and doctoral students.

13 POL-on system – an integrated system of information on higher education, which supports the work of the Ministry of Science and Higher Education, as well as the Central Statistical Office and the Central Commission for Degrees and Titles; collects data on all Polish research units to which public access results from the laws and regulations of the Ministry of Science and Higher Education.

## LEGAL BASIS

§ 2

1. The Doctoral School at the J.J. Śniadecki University of Technology and Life Sciences in Bydgoszcz is conducted on the basis of applicable regulations, in particular:

1) Act of 3 July 2018 – Provisions Introducing the Act – Law on Higher Education and Science (Journal of Laws of 2018, item 1669);
2) Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2018, item 1668);
3) Statute of the J.J. Śniadecki University of Technology and Life Sciences in Bydgoszcz.

## PROTECTIVE REGULATIONS

§ 3

1. Detailed conditions and the procedure of recruitment to the Doctoral School are governed by separate regulations.
2. The detailed procedure, rules and conditions for conducting activities in the doctoral procedure and awarding the doctoral degree (within the meaning of Article 180 of the Act), referred to in Article 192 of the Act, are regulated by separate regulations.
3. Reporting obligations of the entity running the Doctoral School in the scope of entering, updating, archiving and deleting data in the Integrated Information System on Higher Education and Science "POL-on" within the meaning of Article 219(7)(2) of the Act referred to in §1(2)(1) and Article 343(1)(18-19), Article 345, Article 346(1)(11) and Article 348 of the Act, referred to in § 1 section 2 point 2 shall be regulated by separate regulations.

# DIRECTOR OF THE DOCTORAL SCHOOL

§ 4

1. The Doctoral School is managed by the Director.
2. The Director is appointed by the Rector.
3. The Rector appoints the Deputy Director of the Doctoral School at the request of the Director.
4. In matters concerning the School and doctoral students, the Director cooperates with the scientific councils of the scientific disciplines in which education is conducted at the Doctoral School.

§ 5

1. The tasks of the Director of the Doctoral School include, in particular:

1) development of the regulations of the Doctoral School;
2) supervising the overall functioning of the Doctoral School, including the correctness and quality of the implementation of the education and scientific care process and the manner of conducting the mid-term evaluation;
3) providing conditions for providing education at the Doctoral School, including professional practice in the form of teaching or participating in conducting classes, in the amount not exceeding 60 teaching hours per year, provided that professional practice has been included in the curriculum;
4) providing conditions for conducting scientific activity in the entity running the Doctoral School, including scientific research, development works and artistic creation;
5) taking care of the social and living affairs of doctoral students;
6) making decisions in all matters concerning the Doctoral School, not reserved to the competence of the HEI bodies;
7) applying to the competent collegiate and single-member bodies of universities with applications in all matters concerning the Doctoral School;
8) performing other activities provided for by law, provisions of the HEI's statute and resolutions and orders of HEI bodies;
9) disposing, within the framework of the authorisation granted, the financial resources set aside in the HEI's budget in the financial plan for the functioning of the Doctoral School;
10) considering the objections of doctoral students in all matters concerning the Doctoral School, which are not reserved to the competence of the university bodies;
11) issuing administrative decisions, including refusal of admission to the Doctoral School, on removal from the list of doctoral students and in cases regulated by the Doctoral School's regulations or in separate regulations;
12) granting consent for doctoral students to undergo internships and conduct research in scientific institutions outside the entity running the Doctoral School, including supporting grant activity and national and international mobility of doctoral students;

13) developing and making public the detailed rules and competitive procedure of recruitment to the Doctoral School, including the schedule of the qualification procedure and the conditions for its admission and criteria,
and the number of points possible to obtain for individual elements of the recruitment procedure;
14) developing the curriculum at the Doctoral School, including the apprenticeship programme, provided that the apprenticeships have been included in the curriculum;
15) cooperation with the Scientific Councils of the Disciplines in the field of appointing a supervisor or supervisors;
16) cooperation with the socio-economic environment in the field of education of doctoral students;
17) cooperation with the doctoral students' self-government;
18) determining the staffing within the framework of the education programme;
19) determining the composition of the Committee for the Mid-term Evaluation of Doctoral Students;
20) preparing an annual report on the activities of the Doctoral School, which is submitted to the Rector by the end of November of each calendar year for the previous academic year;
21) preparing a self-assessment report in Polish and English for the purpose of evaluating the quality of education;
22) entering, updating, archiving and deleting data in
the Integrated Information System on Higher Education and Science "POL-on"; 23)
supervising the collection of documentation of the course of education;

## SCIENTIFIC COUNCIL OF THE DOCTORAL SCHOOL

§ 6

1. The Doctoral School has a Scientific Council of the Doctoral School, which is an opinion-giving and advisory body.
2. The Scientific Council of the Doctoral School is appointed by the Rector at the request of the Director.
3. The Scientific Council of the Doctoral School elects the Chairman from among the members of the Scientific Council of the Doctoral School who are independent researchers.
4. The Scientific Council of the Doctoral School consists of:
   1) Director and Deputy Director,
   2) two representatives of the scientific disciplines in which the Doctoral School conducts education, indicated from among independent scientific employees, by the relevant Scientific Councils of the disciplines,
   3) a representative of doctoral students appointed by the doctoral students' self-government body.

5. The tasks of the Scientific Council of the Doctoral School include, in particular:
   1) giving opinions on the detailed rules and the competitive procedure of recruitment to the Doctoral School;
   2) giving opinions on the regulations of the Doctoral School;
   3) giving opinions on the curriculum, including the internship program of the Doctoral School;
   4) giving opinions on the qualifications of academic teachers in the field of staff as part of the educational programme at the Doctoral School;
   5) giving opinions on guidelines and principles for the preparation of an individual research plan for doctoral students of the Doctoral School;
   6) giving opinions on the manner and principles of conducting the mid-term evaluation of doctoral students of the Doctoral School;
   7) giving opinions on candidates to the committee conducting the mid-term evaluation of doctoral students of the Doctoral School;
   8) giving opinions on the self-evaluation report for the purposes of evaluating the quality of education at the Doctoral School;
   9) giving opinions on the annual report on the activities of the Doctoral School.

## RIGHTS AND OBLIGATIONS OF DOCTORAL STUDENTS

§7

1. A doctoral student has the right to:

   1) scientific supervision of the supervisor or supervisors in the preparation of the doctoral dissertation;
   2) change of supervisor or supervisors in justified cases;
   3) use of laboratories, scientific and research equipment and apparatus, as well as library collections and IT resources to the extent necessary for the implementation of the educational programme, individual research plan and preparation of the doctoral dissertation, on the terms set out in separate regulations;
   4) extension of the deadline for submitting a doctoral dissertation, but not longer than by 2 years;
   5) receive a doctoral scholarship, the total period of which may not exceed 4 years, provided that he does not have a doctoral degree. The amount of the monthly doctoral scholarship is: 37% of the professor's salary – up to the month in which the mid-term evaluation was carried out; 57% of the professor's salary – after the month in which the mid-term evaluation was carried out.
   6) scientific internships;
   7) apply for accommodation in a student dormitory of the University or meals in the student canteen of the University, on the terms set out in separate regulations;

8) apply for accommodation of a spouse or child in a student dormitory of the university, on the terms set out in separate regulations;
9) rest breaks not exceeding 8 weeks per year;
10) suspension of education for the reasons specified in §14;
11) filing motions for reconsideration of the case in relation to issued administrative decisions;
12) associate in organizations or associations of doctoral students in the entity running the Doctoral School;
13) possession of a doctoral student card;

§8

1. The duties of the PhD Student include:

1) compliance with the provisions of these Terms and Conditions, the regulations for the management of copyrights, related rights, industrial property rights and the rules of commercialisation and the use of research infrastructures;
2) timely implementation of the curriculum and individual research plan;
3) acting in accordance with the oath taken;
4) acting in accordance with the Code of Ethics of a PhD student;
5) participation in classes resulting from the educational program;
6) completing professional practice in the form of conducting classes or participating in their conduct, in the amount not exceeding 60 teaching hours per year, provided that the professional practice has been included in the curriculum;
7) submission of an annual report on the course of the implementation of the education programme and, after 1 year, an individual research plan, and after 2, 3 and 4 years on the implementation of an individual research plan, together with the opinion of the supervisor or supervisors. The annual report is submitted by 15 October of each calendar year for the previous academic year on the terms set out in separate regulations;
8) submitting a statement for the purpose of evaluating the quality of scientific activity, authorizing the university to demonstrate scientific/artistic achievements within the discipline in which the doctoral dissertation is being prepared;
9) having an electronic scientist identifier in accordance with international standards;
10) a report on scientific/artistic achievements that have been created in connection with education at the doctoral school for the purposes of evaluating the quality of scientific activity;
11) reporting data and information reported to the Integrated Information System on Higher Education and Science "POL-on";
12) compliance with fire safety rules and regulations, as well as occupational health and safety;
13) immediately notifying the Director of the Doctoral School of the change of name and address, as well as of the change of other data required by the university;

## THE METHOD OF APPOINTING AND CHANGING THE SUPERVISOR, SUPERVISORS OR ASSISTANT SUPERVISOR

§9

1. Scientific supervision over the preparation of the doctoral dissertation is provided by: 1) the supervisor or supervisors, or 2) the supervisor and assistant supervisor.
2. A supervisor may be a person who has:
   1) a postdoctoral degree, or
   2) the academic title of the professor, or
   3) a person who does not hold the degree of habilitated doctor or professor, who is an employee of a foreign university or scientific institution, if the senate/scientific council for discipline (within the meaning of the body awarding academic degrees in the entity) considers that this person has significant achievements in the field of scientific issues to which the doctoral dissertation relates.
3. An assistant supervisor may be a person holding a doctoral degree.

§10

1) A person who in the last 5 years:
1) was the supervisor of 4 doctoral students who were removed from the list of doctoral students due to a negative result of the mid-term evaluation, or
2) supervised the preparation of doctoral dissertations by at least 2 persons applying for a doctoral degree who did not receive positive reviews.

§11

1. Within 3 months from the date of commencement of education, a supervisor, supervisors or assistant supervisor is appointed to the doctoral student.
2. Within 30 days from the date of commencement of education, the doctoral student applies to the Scientific Council of the Discipline with a request for the appointment of a supervisor, supervisors or an assistant supervisor.
3. The application includes:
   1) a proposal of persons to act as supervisors, supervisors or assistant supervisors;
   2) consent to take up the function of a supervisor; 3) justification.
4. The doctoral student submits the application referred to in paragraph 2 to the Director of the Doctoral School, who expresses an opinion on this matter.
5. The Scientific Council of the Discipline adopts a resolution in a secret ballot on the appointment of a supervisor, supervisors or an assistant supervisor.
6. In justified cases, a doctoral student may apply to the scientific council for the discipline with a request to change the supervisor, supervisors or assistant supervisor.

7. The doctoral student submits the application referred to in paragraph 6 together with the justification to the Director of the Doctoral School, who expresses an opinion on this matter.
8. In justified cases, the Scientific Council of the Discipline adopts a resolution in a secret ballot on the change of the supervisor, supervisors or assistant supervisor.

## CONDITIONS FOR EXTENDING THE DEADLINE FOR SUBMITTING A DOCTORAL DISSERTATION

§12

1. The Director of the Doctoral School, in justified cases, in particular:

   1) the occurrence of unpredictable random events;
   2) temporary inability to pursue education due to illness;
   3) possession of a certificate of disability;
   4) the need to provide personal care for a sick family member;
   5) the need to provide personal care for a child up to the age of four or a child with a certified disability;
   6) problems in the implementation of the research plan that are not the fault of the doctoral student.

   may, at the request of the doctoral student, extend the deadline for submitting the doctoral dissertation, set in the individual research plan, but not longer than by 2 years.

§13

2. The application for extension of the deadline for submitting the doctoral dissertation includes:
   1) doctoral student's data: name, surname, PESEL number, and in the absence of such a number – the number of the document confirming identity and the indication of the semester in which the education takes place,
   2) justification with the expected date of submission of the doctoral dissertation.
3. The application shall be accompanied by:
   1) the opinion of the supervisor, supervisors or assistant supervisor – in the case referred to in §12 section 1 point 6, or
   2) a document justifying the extension of the deadline for submitting a doctoral dissertation – in the cases referred to in §12 section 1 points 1-5.

§14

1. The Director of the Doctoral School, at the request of the doctoral student, suspends education for the period corresponding to the duration of maternity leave, leave under the conditions of maternity leave, paternity leave and maternity leave, as specified in the Act of 26 June 1974 – the Labour Code (Journal of Laws of 1960, No. 30, item 168, as amended).

2. The Director of the Doctoral School, at the request of the doctoral student, may suspend education for no longer than 1 year, due to a long-term illness.

§15

Applications referred to in §12 section 1 point 6 and §12 shall be considered by the Director of the Doctoral School within 14 days of their submission.

§16

Doctoral students' objections to the decisions of the Director of the Doctoral School are considered by the Rector.

## HOW THE MID-TERM EVALUATION IS CARRIED OUT

§17

1. The mid-term evaluation is carried out after the fourth semester of the education period no later than 31 October.
2. The following are subject to mid-term evaluation:
   1) implementation of the individual research plan by the doctoral student, in particular the timeliness and quality of the tasks resulting from the schedule for the preparation of the doctoral dissertation. 2) implementation of the educational program.
3. The mid-term evaluation ends with a positive or negative result.
4. The result of the assessment and the justification shall be public.
5. The HEI running the Doctoral School shall immediately make available in the Public Information Bulletin on its website information on the result of the evaluation together with the justification.
6. The doctoral student has the right to appeal against the result of the mid-term evaluation to the Director of the Doctoral School.
7. The deadline for filing an appeal with justification is 7 days from the date of making the results of the assessment available.

§18

1. The mid-term evaluation is carried out by the Committee for the Mid-term Evaluation of Doctoral Students, hereinafter referred to as the Committee, which consists of 3 persons, including at least 1 person holding the degree of habilitated doctor or the title of professor in the discipline in which the doctoral dissertation is being prepared, employed outside the entity running the Doctoral School.
2. The Committee for Mid-Term Evaluation of Doctoral Students is appointed by the Director in consultation with the Scientific Council of the Doctoral School.
3. The supervisor and the assistant supervisor cannot be members of the Commission.
4. The mid-term evaluation takes place before the committee, in the form of:

1) the doctoral student's self-report on the progress of work on the preparation of the doctoral dissertation,
2) discussion, during which the doctoral student is asked questions,
3) discussing the progress of education,
4) discussion of the doctoral student's annual reports on the implementation of the research plan, 5) discussion of the opinion of the supervisor or supervisors.

## RULES OF EDUCATION

§19

1. Admission to the Doctoral School takes place by entering the list of doctoral students.
2. A doctoral student begins education and acquires the rights of a doctoral student at the moment of taking the oath.
3. At a time, you can only be a PhD student at one doctoral school.
4. No fees are charged for the education of doctoral students at the Doctoral School.
5. The academic year lasts from 1 October to 30 September and is divided into 2 semesters.

§20

1. Education of doctoral students at the Doctoral School:
   1) it takes place in a full-time form and lasts 8 semesters;
   2) it is conducted on the basis of an educational programme and an individual research plan;
   3) prepares for obtaining a doctoral degree; 4) ends with the submission of a doctoral dissertation.
2. The condition for passing one year of education is:
   1) obtaining credits and passing the exams provided for in the education plan for a given year,
   2) completion of professional practice, if it is planned for a given year of education, 3) submission of an annual report.
3. A doctoral student is not entitled to repeat a year or resume education after being removed from the list of doctoral students for the reasons specified in §25 points 1.1, 1.2, 2.1 and 2.2.
4. If one subject is not passed within the specified deadline, in a given academic year, the Director of the Doctoral School may issue decisions on conditional permission to continue education in the following year. A doctoral student who has not passed a course from a given year is obliged to pass this subject no later than in the next academic year in which he or she will start studying.
5. The doctoral dissertation presents the general theoretical knowledge of the doctoral student in the discipline or disciplines and the ability to independently conduct scientific or artistic work.
6. The subject of the doctoral dissertation is an original solution to a scientific problem, an original solution in the field of applying the results of one's own scientific research in the economic or social sphere, or an original artistic achievement.

7. A doctoral dissertation may consist of a written work, including a scientific monograph, a collection of published and thematically related scientific articles, design, construction, technological, implementation or artistic work, as well as an independent and separate part of a collective work.

§21

1. The curriculum is determined by the Senate, subject to the requirement to consult the doctoral students' self-government. In the event of ineffective expiry of the time limit specified in the statutes, the requirement to consult is deemed to have been met.
2. The curriculum may provide for professional practice in the form of conducting classes or participating in their conduct, in the amount not exceeding 60 teaching hours per year.

§22

1. The doctoral student, in agreement with the supervisor or supervisors, prepares an individual research plan and submits it to the Director of the Doctoral School no later than 12 months from the date of commencement of education.
2. If an assistant supervisor is appointed, the plan is submitted after the supervisor has given its opinion.

§23

1. The individual research plan of the doctoral student shall specify in particular:

1) the schedule for the preparation of the doctoral dissertation, including the deadline for submitting the dissertation;
2) the deadline for submission to publication of at least 1 scientific article published in a scientific journal or in peer-reviewed materials from an international conference, which in the year of publication of the article in its final form were included in the list prepared in accordance with the regulations issued pursuant to Article 267(2)(2)(b) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2018, item 1668) or 1 of a scientific monograph published by a publishing house, which in the year of publication of the monograph in its final form was included in the list prepared in accordance with the regulations issued pursuant to Article 267(2)(2)(a) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2018, item 1668) or a chapter in such a monograph;
3) compulsory, participation in a scientific conference – national or international;
4) compulsory, preparation and submission of a grant application to a national or foreign agency financing scientific activity through a competition; 5) mandatory, research objectives, research schedule, expected results.
6) compulsory, completion of at least a one-month research internship at a domestic or foreign university or scientific institution or a study trip lasting at least 1 week to a domestic or foreign university or scientific institution;

7) optionally, participation in co-organizing a national or international scientific conference;
8) optionally, disseminating R+D results on the basis of open access;

§24

1. The curriculum and the individual research plan shall take into account the characteristics of the second level of learning outcomes for qualifications at level 8. Polish Qualifications Framework, typical for qualifications obtained within the higher education and science system after obtaining a full qualification at level 4 of the Polish Qualifications Framework, included in:

1) category of knowledge in relation to which the characteristics specify:
   a) scope and depths – completeness of the cognitive perspective and dependencies,
   b) context – conditions, effects;
2) skill category for which the characteristics specify:
   a) in the field of knowledge use – problems solved and tasks performed,
   b) in the field of communication – receiving and creating statements, disseminating knowledge in the scientific community and using a foreign language,
   c) in the field of work organization – planning and teamwork,
   d) in the field of learning – planning one's own development and the development of others;
3) category of social competences, in relation to which the characteristics determine:
   a) in terms of assessments, a critical approach,
   b) in the field of responsibility – fulfilling social obligations and acting for the public interest,
   c) in relation to the professional role – independence and the development of ethos.

§25

1. A doctoral student is removed from the list of doctoral students in the case of:
   1) a negative result of the mid-term evaluation;
   2) failure to submit a doctoral dissertation within the deadline specified in the individual research plan;
   3) resignation from education.
2. A PhD student may be removed from the list of PhD students in the event of:
   1) unsatisfactory progress in the preparation of the doctoral dissertation;
   2) failure to comply with the obligations arising from the regulations of the Doctoral School, the curriculum and the individual research plan.

§26

1. Deletion from the list of doctoral students takes place by means of an administrative decision. The decision may be subject to a request for reconsideration of the case.
2. A doctoral student who has been removed from the list of doctoral students will cease to receive the doctoral scholarship on the first day of the month following the month in which the decision to remove them from the list of doctoral students became final.

§27

1. In the event of discontinuation of the education of doctoral students in at least one discipline from which education is provided at the Doctoral School, the entity running the Doctoral School shall provide doctoral students preparing a doctoral dissertation in this discipline with the opportunity to continue their education at another doctoral school in this discipline.
2. In the absence of a Doctoral School providing education in this discipline, the entity running the Doctoral School in which education has been discontinued shall cover the costs of the procedure for awarding a doctoral degree in the external procedure to persons who have lost the opportunity to complete their education.

## METHOD OF DOCUMENTING THE COURSE OF EDUCATION

§28

1. The Doctoral School keeps documentation of the course of education.
2. The documentation of the course of education at the Doctoral School consists of:
   1) an album of doctoral students;
   2) files of personal files of doctoral students;
   3) the doctoral student's periodic achievements card;
3. Documentation of the course of education at the Doctoral School is conducted in electronic form.

## TRANSITIONAL AND FINAL PROVISIONS

§29

1. Education at the Doctoral School begins on 1 October 2019 and lasts until 30 September 2022.
2. The rules of admission to the Doctoral School and the curriculum of the Doctoral School are made public for the first time by 31 May 2019.

# Resolution No. 16/431 of the Senate of the UTP University of Science and Technology in Bydgoszcz of 18 September 2019

amending Senate Resolution No. 8/428 of 22 May 2019 on the adoption of Regulations of the Doctoral School of the UTP University of Science and Technology in Bydgoszcz

Pursuant to Article 292 of the Act of 3 July 2018, the provisions introducing the Act — Law on Higher Education and Science (Journal of Laws of 2018, item 1669, as amended)

The Senate of

the UTP University of Science and Technology in Bydgoszcz

is hereby announcing the following:

## §1

In the annex to the Resolution of the Senate of the UTP University of Science and Technology in Bydgoszcz No. 8/428 of 22 May 2019 on the adoption of the Regulations of the Doctoral School of the UTP University of Science and Technology in Bydgoszcz, the words "Scientific Council of the Doctoral School" used in various cases are changed and replaced by the words "Council of the Doctoral School" in appropriate cases.

The resolution enters into force at the beginning of the academic year 2019/2020.

# Resolution No. 1/441
# Senate
# UTP University of Science and Technology in Bydgoszcz
# of 15 April 2020

**concerning**: *adoption of the Regulations of the Doctoral School of the UTP University of Science and Technology in Bydgoszcz*

**Based on:**

- Article 205(2) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2018, item 1668, as amended).

*Senate of the UTP*
*University of Science and Technology in Bydgoszcz*
*resolves as follows:*

1. Regulations of the Doctoral School of the UTP University of Science and Technology in Bydgoszcz, attached to this resolution.
2. Resolution No. 8/428 of the Senate of the UTP of 22 May 2019 is repealed.
3. The resolution enters into force on the day of its adoption.

**UTP**

**University of Science and Technology in Bydgoszcz**

# REGULATIONS OF THE DOCTORAL SCHOOL

Bydgoszcz 2020

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# GENERAL

§ 1

1. The Regulations of the Doctoral School of Engineering, Technology, Agriculture, Science and Natural Sciences, hereinafter referred to as the "Regulations", at the UTP
2. University of Science and Technology in Bydgoszcz, hereinafter referred to as UTP, define the mode and organization of education at the Doctoral School and the related rights and obligations of doctoral students.
3. The Doctoral School provides education in scientific disciplines in which the University is authorized to award doctoral degrees.
4. The administrative seat of the Doctoral School is the Dean's Office of the Faculty of Mechanical Engineering.
5. Explanation of terms used in the Terms and Conditions:
   1) doctoral student – a person undergoing education at the Doctoral School as a young scientist within the meaning of Article 360(2)(1) of the Act of 20 July 2018 – Law on Higher Education and Science;
   2) learning outcomes at the Doctoral School – learning outcomes defined at level 8. Polish Qualifications Framework;
   3) scientist identifier – an alphanumeric code ORCID (Open Researcher and Contributor ID) created to uniquely identify authors of scientific and academic publications;
   4) individual research plan – a plan containing a schedule for the preparation of the doctoral dissertation with an indication of the deadline for submitting the doctoral dissertation;
   5) professional practice – practice in the form of conducting classes or participating in their conduct, in the amount not exceeding 60 teaching hours per year;
   6) POL-on system – a repository of data on Polish science and higher education.

## LEGAL BASIS

§ 2

1. The Doctoral School at the UTP University of Science and Technology in Bydgoszcz in Bydgoszcz is run on the basis of applicable regulations, in particular:
   1) the Act of 3 July 2018 – Provisions Introducing the Act – Law on Higher Education and Science;
   2) the Act of 20 July 2018 – Law on Higher Education and Science;
   3) of the statute of the UTP University of Science and Technology in Bydgoszcz.

## SEPARATE REGULATIONS

§ 3

1. Detailed conditions and the procedure of recruitment to the Doctoral School are governed by separate regulations.
2. The activities in the procedure for awarding a doctoral degree, referred to in Article 192 of the Act, are governed by separate regulations.
3. The reporting obligations of the entity running the Doctoral School in the field of entering, updating, archiving and deleting data in the Integrated Information System on Higher Education and Science "POL-on" are regulated by separate regulations.
4. The Code of Administrative Procedure applies to the resolution of individual cases to the extent not regulated by the Act or the Regulations.

## DIRECTOR OF THE DOCTORAL SCHOOL

§ 4

1. The Doctoral School is managed by the Director and his Deputy.
2. The Director is appointed by the Rector.
3. The Deputy Director is appointed by the Rector at the request of the Director of the Doctoral School.

§ 5

1. The tasks of the Director of the Doctoral School include, in particular:
   1) preparing draft regulations and proposing changes to the regulations of the Doctoral School;
   2) supervision over the overall functioning of the Doctoral School, in particular over the correctness and quality of the implementation of the education process and scientific supervision and the manner of conducting the mid-term evaluation;
   3) providing conditions for providing education at the Doctoral School, in particular completing professional internships in the form of conducting classes or participating in their conduct;
   4) disposing, within the framework of the authorisation granted, the financial resources set aside in the HEI's budget in the financial plan for the functioning of the Doctoral School;

5) considering the objections of doctoral students in all matters concerning the Doctoral School, not reserved to the competence of the UTP bodies;
6) issuing administrative decisions concerning the recruitment process and the course of education at the Doctoral School, referred to in § 28.
7) granting consent for doctoral students to undergo internships and conduct research in scientific institutions outside the entity running the Doctoral School, including supporting grant activity and national and international mobility of doctoral students;
8) developing and making public the detailed rules and the competitive procedure of recruitment to the Doctoral School;
9) developing the curriculum at the Doctoral School;
10) cooperation with the Scientific Councils of the Disciplines in the field of appointing a supervisor or supervisors or a supervisor and an assistant supervisor;
11) cooperation with the doctoral students' self-government;
12) determining the staffing for the implementation of the education programme;
13) determining the composition of the Committee for the Mid-term Evaluation of Doctoral Students;
14) preparing a self-assessment report in Polish and English for the purpose of evaluating the quality of education;
15) entering, updating, archiving and deleting data in the Integrated Information System on Higher Education and Science "POL-on";
16) supervision over the collection of documentation of the course of education.

2. The tasks of the Deputy Director of the Doctoral School include, in particular:
   1) replacing the Director in his absence;
   2) performing other works commissioned by the Director.

## DOCTORAL SCHOOL COUNCIL

§ 6

1. The Doctoral School Council operates at the Doctoral School, which is an opinion-giving and advisory body.
2. The Doctoral School Council is appointed by the Rector at the request of the Director.
3. The Council of the Doctoral School consists of:
   1) The Director of the Doctoral School as its Chairman and Deputy Director acting as Deputy Chairman,
   2) The Chairman of the Councils of Scientific Disciplines in which the education of doctoral students is conducted and its member indicated by these Councils, who is an independent researcher and, at the same time, if possible, an academic teacher participating in the education of doctoral students or being the supervisor of the doctoral dissertation,
   3) a representative of doctoral students appointed by the doctoral students' self-government body.
4. The tasks of the Doctoral School Council include, in particular:

1) giving opinions on the detailed rules and the competitive procedure of recruitment to the Doctoral School;
2) giving opinions on the draft regulations of the Doctoral School;
3) giving opinions on the educational programme of the Doctoral School;
4) giving opinions on candidates to the committee conducting the mid-term evaluation of doctoral students of the Doctoral School;
5) giving opinions on the self-assessment report for the purposes of evaluating the quality of education at the Doctoral School.

5. The Council issues opinions in the form of resolutions adopted by a simple majority of votes.

## RIGHTS AND OBLIGATIONS OF DOCTORAL STUDENTS

§7

1. A PhD student has the right to:
   1) scientific supervision of the supervisor or supervisors, or the supervisor and assistant supervisor in the preparation of the doctoral dissertation;
   2) change of supervisor or supervisors in justified cases;
   3) use laboratories, scientific and research equipment and apparatus, as well as library collections and IT resources to the extent necessary for the implementation of the educational programme, individual research plan and preparation of the doctoral dissertation, on the terms set out in separate regulations;
   4) extension of the deadline for submitting a doctoral dissertation, but not longer than by 2 years;
   5) receive a doctoral scholarship, the total period of which may not exceed 4 years, provided that he does not have a doctoral degree. The amount of the monthly doctoral scholarship is:
      a) 37% of the professor's remuneration – until the month in which the mid-term evaluation was carried out;
      b) 57% of the professor's remuneration – after the month in which the mid-term evaluation was carried out;
   6) scientific internships;
   7) apply for accommodation in a student dormitory of the University or meals in the student canteen of the University, on the terms set out in separate regulations;
   8) apply for accommodation of a spouse or child in a student dormitory of the university, on the terms set out in separate regulations;
   9) rest breaks not exceeding 8 weeks per year;
   10) suspension of education for the reasons specified in §14;
   11) filing motions for reconsideration of the case in relation to issued administrative decisions;
   12) associate in organizations or associations of doctoral students in the entity running the Doctoral School;
   13) have a doctoral student card.

§8

1. The duties of a PhD student include:
   1) compliance with the provisions of these Terms and Conditions;
   2) timely implementation of the curriculum and individual research plan;
   3) participation in classes resulting from the educational program;
   4) submission of an individual research plan by 30 September of the 1st year of education together with the acceptance of this plan by the supervisor or supervisors or the supervisor and assistant supervisor (Appendix No. 3);
   5) submission of a report on the implementation of the individual research plan by 30 September of the 2nd, 3rd and 4th year of education, together with the opinion of the supervisor(s) or the supervisor and assistant supervisor (Appendix No. 3);
   6) acting in accordance with the oath taken;
   7) acting in accordance with the Code of Ethics of the PhD Student;
   8) submitting a statement for the purpose of evaluating the quality of scientific activity, authorizing the university to demonstrate scientific achievements within the discipline in which the doctoral dissertation is being prepared;
   9) having an electronic scientist identifier in accordance with international standards;
   10) a report on scientific achievements that have arisen in connection with education at the doctoral school for the purposes of evaluating the quality of scientific activity;
   11) providing the Head of the School with the information required by law in order to enter it into the Integrated Information System on Higher Education and Science "POL-on";
   12) compliance with fire safety rules and regulations, as well as occupational health and safety;
   13) immediately notifying the Director of the Doctoral School of the change of name and address, as well as of the change of other data required by the university.

## METHOD OF APPOINTING AND CHANGING THE SUPERVISOR, SUPERVISORS OR SUPERVISOR AND ASSISTANT SUPERVISOR

§9

1. Scientific supervision over the preparation of the doctoral dissertation is provided by:
   1) supervisor or supervisors, or
   2) supervisor and assistant supervisor.
2. A supervisor may be a person who has:
   1) a postdoctoral degree, or
   2) the academic title of the professor, or
   3) a person who does not hold the degree of habilitated doctor or the title of professor, who is an employee of a foreign university or scientific institution, if the Senate or the Scientific Council of the Discipline considers that the person has significant achievements in the field of scientific issues to which the doctoral dissertation relates.

3. An assistant supervisor may be a person holding a doctoral degree.

§10

1. A person who in the last 5 years:
   1) was the supervisor of 4 doctoral students who were removed from the list of doctoral students due to a negative result of the mid-term evaluation, or
   2) supervised the preparation of doctoral dissertations by at least 2 persons applying for a doctoral degree who did not receive positive reviews.

§11

1. Within 30 days from the date of commencement of education, the doctoral student applies to the Scientific Council of the Discipline with an application (Appendix No. 1) for the appointment of a supervisor or supervisors, or a supervisor and an assistant supervisor.
2. A doctoral student may apply to the Scientific Council of the Discipline with a request (Appendix No. 2) to change the supervisor or supervisors, or the supervisor and assistant supervisor.
3. The application referred to in paragraphs 1 and 2 shall contain m.in:
   1) a proposal from the person or persons of the supervisor or supervisors, or of the supervisor and assistant supervisor;
   2) consent to take up the function of supervisor or supervisors, or supervisor and assistant supervisor;
   3) justification.
4. The application referred to in paragraphs 1 and 2 must be reviewed by the Director of the Doctoral School.
5. Within 3 months from the date of commencement of education, the Scientific Council of the Discipline appoints a supervisor or supervisors, or a supervisor and an assistant supervisor to the doctoral student.

## CONDITIONS FOR EXTENDING THE DEADLINE FOR SUBMITTING A DOCTORAL DISSERTATION

§12

1. The Director of the Doctoral School, at the request of the doctoral student, may extend the deadline for submitting the doctoral dissertation, set in the individual research plan, but not longer than by 2 years, in justified cases, in particular:
   1) the occurrence of unpredictable random events;
   2) temporary inability to pursue education due to illness;
   3) possession of a certificate of disability;
   4) the need to provide personal care for a sick family member;
   5) the need to provide personal care for a child up to the age of four or a child with a certified disability;
   6) problems in the implementation of the research plan that are not the fault of the doctoral student.

§13

2. The application for extension of the deadline for submitting the doctoral dissertation includes:
   1) doctoral student's data: name, surname, PESEL number, and in the absence of such a number – the number of the document confirming identity and the indication of the semester in which the education takes place,
   2) justification with the expected date of submission of the doctoral dissertation.
3. The application shall be accompanied by:
   1) a document justifying the extension of the deadline for submitting a doctoral dissertation – in the cases referred to in §12 section 1 points 1-5, or
   2) the opinion of the supervisor, supervisors or assistant supervisor – in the case referred to in §12 section 1 point 6

§14

1. The Director of the Doctoral School, at the request of the doctoral student, suspends education for the period corresponding to the duration of maternity leave, leave under the conditions of maternity leave, paternity leave and maternity leave, specified in the Act of 26 June 1974 – the Labour Code.
2. The Director of the Doctoral School, at the request of the doctoral student, may suspend education due to a long-term illness, for no longer than 1 year.

§15

1. A written application of the doctoral student, in the matters referred to in §12 and §14, should be submitted no later than 21 days from the date of occurrence of the circumstances.
2. The applications referred to in §12 section 1 point 6 and §14 are considered by the Director of the Doctoral School within 14 days of their submission.

## HOW THE MID-TERM EVALUATION IS CARRIED OUT

§16

1. The mid-term evaluation is carried out after the fourth semester of the education period no later than 31 October.
2. The following are subject to mid-term evaluation:
   1) implementation of an individual research plan by the doctoral student;
   2) implementation of the curriculum.
3. The mid-term evaluation ends with a positive or negative result.
4. The result of the assessment and the justification shall be public.
5. The University running the Doctoral School shall immediately make available in the Public Information Bulletin on its website information on the result of the evaluation with the justification.
6. The doctoral student has the right to appeal against the result of the mid-term evaluation to the Director of the Doctoral School.

7. The deadline for lodging an appeal with the justification is 14 days from the date of making the results of the assessment available.
8. The Director shall consider the appeals referred to in point 6 within 14 days from the date of their submission.

§17

1. The mid-term evaluation is carried out by the Committee for the Mid-term Evaluation of Doctoral Students, hereinafter referred to as the Committee, which consists of 3 persons, including at least 1 person holding the degree of habilitated doctor or the title of professor in the discipline in which the doctoral dissertation is being prepared, employed outside the entity running the Doctoral School.
2. The Committee for the Mid-Term Evaluation of Doctoral Students is appointed by the Director in consultation with the Council of the Doctoral School.
3. The supervisor and the assistant supervisor cannot be members of the Commission.
4. The mid-term evaluation takes place before the committee, in the form of:
   1) presentation of a self-report by a doctoral student on the implementation of an individual research plan,
   2) discussion, during which the doctoral student is asked questions,
   3) discussion of the doctoral student's annual report on the implementation of the research plan,
   4) discussion of the supervisor's or supervisors' opinions,
   5) Discussing learning progress.

## EDUCATION RULES

§18

1. Admission to the Doctoral School takes place by entering the list of doctoral students.
2. A doctoral student begins education and acquires the rights of a doctoral student at the moment of taking the oath.
3. At a time, you can only be a PhD student at one doctoral school.
4. No fees are charged for the education of doctoral students at the Doctoral School.
5. The following may participate in the education of doctoral students: a) in accordance with Article 115(1) of the Act of 20 July 2018. Law on Higher Education and Science, academic teachers who are research, research and teaching or teaching staff, and b) specialists from the socio-economic environment.

§19

1. The academic year lasts from 1 October to 30 September and is divided into 2 semesters.
2. Education of doctoral students at the Doctoral School:
   1) it takes place in a full-time form and lasts 8 semesters;
   2) it is conducted on the basis of an educational programme and an individual research plan;
   3) prepares for obtaining a doctoral degree;

4) ends with the submission of a doctoral dissertation.

3. The condition for passing one year of education is:
   1) obtaining credits and passing the exams provided for in the education plan for a given year,
   2) in the 1st year of education, submission of an individual research plan (Appendix No. 3) by 30 September together with the acceptance of this plan by the supervisor or supervisors or the supervisor and assistant supervisor,
   3) in the 2nd, 3rd and 4th year of education, submission of a report on the implementation of the individual research plan (Appendix 3) by 30 September, together with the opinion of the supervisor(s) or the supervisor and assistant supervisor.
4. A doctoral student is not entitled to repeat a year or resume education after being removed from the list of doctoral students for the reasons specified in §25 points 1.1, 1.2, 2.1 and 2.2.
5. If one subject is not passed within the specified deadline, in a given academic year, the Director of the Doctoral School may issue decisions on conditional permission to continue education in the following year. A doctoral student who has not passed a course from a given year is obliged to pass this subject no later than in the next academic year in which he or she will start studying.

§20

1. A doctoral student of a Doctoral School run by an entity other than UTP, after completing at least the first settlement period, may continue their education at the UTP Doctoral School, with the consent of the Director expressed after consulting the supervisor.
2. The Director qualifies the candidate for admission in the transfer mode, specifying the scope and deadlines for completing the curriculum differences.
3. A qualified person is entered on the list of doctoral students of the Doctoral School after submitting a decision on deletion at the doctoral school from which he or she is transferred, and taking the oath referred to in § 18 point 2.
4. A doctoral student, after fulfilling all obligations towards the Doctoral School at UTP, may move to a doctoral school run by another entity.

§21

1. The curriculum is adopted by the Senate with the requirement to consult the doctoral students' self-government. In the event of ineffective expiry of the time limit specified in the statutes, the requirement to consult is deemed to have been met.
2. The curriculum may provide for professional practice in the form of conducting classes or participating in their conduct, in the amount not exceeding 60 teaching hours per year.

§22

1. The individual research plan of the doctoral student specifies in particular:

1) the proposed title of the doctoral dissertation, research objectives or research hypotheses, the schedule for the preparation of the doctoral dissertation, including the research program, expected results, the deadline for submitting the dissertation;
2) the deadline for submission to publication of at least 1 scientific article published in a scientific journal or in peer-reviewed materials from an international conference, which in the year of publication of the article in its final form were included in the list prepared in accordance with the regulations issued pursuant to Article 267(2)(2)(b) of the Act of 20 July 2018 – Law on Higher Education and Science or 1 scientific monograph published by the publishing house, which, in the year of publication of the monograph in its final form, was included in the list drawn up in accordance with the regulations issued pursuant to Article 267(2)(2)(a) of the Act of 20 July 2018 – Law on Higher Education and Science, or a chapter in such a monograph;
3) participation in a scientific conference – national or international;
4) preparation and submission of a grant application to a national or foreign agency financing scientific activity through a competition;
5) completion of at least a one-month research internship at a domestic or foreign university or scientific institution or a study trip lasting at least 1 week to a domestic or foreign university or scientific institution.

2. A doctoral student may apply to the Director of the Doctoral School for a change in the Individual Research Plan, once in the course of education. The application should include a justification, a revised Individual Research Plan and the consent of the supervisor(s).

§23

The curriculum and the individual research plan take into account the characteristics of the second level of learning outcomes for qualifications at level 8. the Polish Qualifications Framework,

§24

1. A doctoral student is removed from the list of doctoral students in the case of:
   1) a negative result of the mid-term evaluation;
   2) failure to submit a doctoral dissertation within the deadline specified in the individual research plan;
   3) resignation from education.
2. A PhD student may be removed from the list of PhD students in the event of:
   1) unsatisfactory progress in the preparation of the doctoral dissertation;
   2) failure to comply with the obligations arising from the regulations of the Doctoral School, regarding the implementation of the educational program and the individual research plan.
3. Deletion from the list of doctoral students takes place by means of an administrative decision. The appeal procedure is specified in §28 of the Regulations.

§25

A doctoral student who has been removed from the list of doctoral students will cease to receive the doctoral scholarship on the first day of the month following the month in which the decision to remove them from the list of doctoral students became final.

§26

1. In the event of discontinuation of the education of doctoral students in at least one discipline from which education is provided at the Doctoral School, the entity running the Doctoral School shall provide doctoral students preparing a doctoral dissertation in this discipline with the opportunity to continue their education at another doctoral school in this discipline.
2. In the absence of a Doctoral School providing education in this discipline, the entity running the Doctoral School in which education has been discontinued shall cover the costs of the procedure for awarding a doctoral degree in the external procedure to persons who have lost the opportunity to complete their education.

## METHOD OF DOCUMENTING THE COURSE OF EDUCATION

§27

1. The Doctoral School keeps documentation of the course of education.
2. The documentation of the course of education at the Doctoral School consists of:
   1) an album of doctoral students;
   2) files of personal files of doctoral students;
   3) the doctoral student's periodic achievements card;
3. Documentation of the course of education at the Doctoral School is conducted in electronic form.

## DECISIONS

§28

1. Director of the Doctoral School:
   1) enters the list of doctoral students;
   2) issues administrative decisions:
      a) on the refusal of admission to the Doctoral School;
      b) on deletion from the list of doctoral students.
2. Pursuant to Article 200(5) and Article 203(3) of the Act of 20 July 2018. Law on Higher Education and Science, the decisions referred to in paragraph 1 point 2 may be subject to a request for reconsideration of the case.
3. The application referred to in paragraph 2 shall be submitted to the School Head within fourteen days from the date of delivery of the decision.

Appendix No. 1 to the Regulations of the Doctoral School
UTP University of Science and Technology in Bydgoszcz

Bydgoszcz.....

**……**
Name and surname of the doctoral student

**…….**
album number

**…….**
telephone

**…….**
Mail

**SCIENTIFIC COUNCIL OF THE DISCIPLINE**
**MECHANICAL ENGINEERING,**
**CHEMICAL SCIENCES,**
**AGRICULTURE AND HORTICULTURE,**
**ANIMAL SCIENCE AND FISHERIES/***

# REQUEST

I kindly ask you to appoint a supervisor(s) and an assistant supervisor* for my doctoral dissertation in the person(s):

1) Supervisor.....
(name and surname, degree or academic title)
2) Supervisor.....
(name and surname, degree or academic title)
3) Assistant supervisor .....
(name and surname, degree or academic title)

*Justification*:
……
.....
.....

I attach to the application the consent of the above-mentioned persons to take up the function of supervisors.

…….

(legible signature of the PhD student)

***Opinion of the Director of the Doctoral School:***

……

……

……

(signature of the Director of the Doctoral School)

* delete unnecessary

Appendix No. 2 to the Regulations of the Doctoral School
UTP University of Science and Technology in Bydgoszcz

Bydgoszcz.....

**……**
Name and surname of the doctoral student

**…….**
album number

**…….**
telephone

**…….**
Mail

**SCIENTIFIC COUNCIL OF THE DISCIPLINE**
**MECHANICAL ENGINEERING,**
**CHEMICAL SCIENCES,**
**AGRICULTURE AND HORTICULTURE,**
**ANIMAL SCIENCE AND FISHERIES/***

# REQUEST

I kindly ask you to change the supervisor(s)/assistant supervisor* of my doctoral dissertation in person(s):

1) Supervisor.....
(name and surname, degree or academic title)
2) Supervisor.....
(name and surname, degree or academic title)
3) Assistant supervisor .....
(name and surname, degree or academic title)

*Justification*:
……
.....
.....

I attach to the application the consent of the above-mentioned persons to take up the function of supervisors.

…….

(legible signature of the PhD student)

***Opinion of the Director of the Doctoral School:***

……

……

……

(signature of the Director of the Doctoral School)

* delete unnecessary

*Name and surname of the doctoral student*
Enter your name.
*PhD student's album number*
Enter the album number.
*Date of preparation*
Click or tap to enter a date.

**Director of the Doctoral School of the**
**UTP University of Science and Technology**
**in Bydgoszcz**

# Individual Research Plan and report on its implementation

## PhD student at the Doctoral School of the UTP University of Science and Technology in Bydgoszcz

| Submission of an individual research plan | Submission of the IPB Implementation Report | | |
|---|---|---|---|
| Year I | Year II | Year III | Year IV |
| X | | | |

## 1. Characteristics of the doctoral dissertation

*Field and discipline in which the dissertation is prepared*
Specify the scientific field and discipline.

*Supervisor or supervisors, or supervisor and assistant supervisor*
Provide the personalities of the supervisors.

*Proposed title of the dissertation*
Provide the proposed title of the dissertation.

*Research goals or research hypothesis*
List research goals or define a hypothesis.

*Expected results, contribution to the development of the discipline*
Describe the expected results of the research.

## 2. Schedule of the Individual Research Plan

| Task number | Year of education | Deadline | Task description | Assess the progress of the task |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| | | | | |
| | | | | |
| | IV | May 2023 | Submission of a doctoral dissertation | |

## 3. Instructions for preparing the schedule of the Individual Research Plan

3.1 The schedule must include tasks resulting from the implementation of the research program and the preparation of the doctoral dissertation.

*For each item of the schedule, the name of the research task or organizational project, the goal, substantive content, method of implementation, methods and tools used, the planned effects of the task or undertaking and the source of funding should be provided*

3.2 The schedule must contain at least one task from the following list of mandatory tasks:

a. The planned date of publication of at least 1 scientific article published in a scientific journal or in peer-reviewed materials from an international conference, which in the year of publication of the article in its final form were included in the list prepared in accordance with the regulations issued pursuant to Article 267(2)(2)(b) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2018, item 1668) or 1 of a scientific monograph published by a publishing house, which in the year of publication of the monograph in its final form was included in the list prepared in accordance with the regulations issued pursuant to Article 267(2)(2)(a) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2018, item 1668) or a chapter in such a monograph.

*The name of the journal, the number of points and the date of publication should be provided*

b. Active participation in a national or international scientific conference

*The name of the conference, the date of the conference, the form of the presentation (poster, oral presentation), sources of funding should be provided.*

c. Submission of a grant application to a national or foreign agency financing scientific activity through a competition

*Please indicate the name of the research funding agency, the name of the call, the title of the project and the date of submission of the proposal*

d. Data on at least a one-month research internship at a national or foreign university or scientific institution or a study trip of at least 1 week to a domestic or foreign university or scientific institution

*The name of the university or scientific institution, the date of the stay, the scientific objectives of the trip, and the sources of funding should be provided*

e. Submission of a doctoral dissertation

*The date of submission of the doctoral dissertation should be provided*

3.3 The timetable may also include other, non-compulsory scientific objectives

*List other scientific intentions, e.g.: participation in co-organization of a national or international scientific conference, dissemination of R+D results on the basis of open access.*

| Signature of the PhD student | Signatures of the supervisor(s) or supervisors or supervisor and assistant supervisor |
|---|---|

# Resolution No. 2/453

## Senate

## UTP University of Science and Technology in Bydgoszcz

## of 20 January 2021

**on the adoption of the Regulations of the Doctoral School of the UTP University of Science and Technology in Bydgoszcz**

Pursuant to: Article 205(2) and (4) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2020, item 85, as amended)

*Senate of the UTP University of Science and Technology in Bydgoszcz*

***resolves*** *as follows:*

**§ 1**

The Regulations of the Doctoral School of the UTP University of Science and Technology in Bydgoszcz, which are attached to this resolution, are hereby adopted.

**§ 2**

Resolution No. 1/441 of the Senate of the UTP of 15 April 2020 on the adoption of the Regulations of the Doctoral School of the UTP University of Science and Technology in Bydgoszcz is repealed.

**§ 3**

The resolution enters into force on 1 October 2021.

**President of the Senate**

**Rector**

**prof. dr hab. inż. Marek ADAMSKI**

UTP University of Science and Technology in Bydgoszcz

# REGULATIONS OF THE DOCTORAL SCHOOL

Bydgoszcz 2021

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# GENERAL PROVISIONS

Section 1

1. The Regulations of the Szkoła Doktorska Uniwersytetu Technologiczno – Przyrodniczego im. J. J. Śniadeckich w Bydgoszczy [The Doctoral School], hereinafter referred to as the "Regulations", at the Uniwersytet Technologiczno-Przyrodniczy im. J.J. Sniadeckich w Bydgoszczy [UTP University of Science and Technology in Bydgoszcz], hereinafter referred to as "UTP", shall determine the mode and organisation of education at the Doctoral School, and the rights and obligations of doctoral students related thereto.
2. The Doctoral School is run by the UTP University of Science and Technology in Bydgoszcz.
3. The Doctoral School provides education in scientific disciplines in which the University is authorised to award the doctoral degree.
4. The administrative office of the Doctoral School is at the Al. Prof. S. Kaliskiego 7 in Bydgoszcz.

# LEGAL BASIS

Section 2

1. The Doctoral School at the Uniwersytet Technologiczno-Przyrodniczy im. J.J. Sniadeckich w Bydgoszczy [UTP University of Science and Technology in Bydgoszcz] operates on the basis of existing legislation, in particular:
   1) the Act of 3 July 2018 — Provisions introducing the Act — Law on Higher Education and Science;
   2) the Act of 20 July 2018 — Law on Higher Education and Science;
   3) the Bylaws of the UTP University of Science and Technology in Bydgoszcz.

# OTHER PROVISIONS

Section 3

1. The detailed terms and procedures of admission to the Doctoral School shall be regulated by separate regulations.
2. The activities in the proceedings concerning the award of the doctoral degree referred to in Article 192 of the Act shall be regulated by separate provisions.
3. The reporting obligations of the entity running the Doctoral School with regard to entering, updating, archiving and erasing data in the Zintegrowany System Informacji o Szkolnictwie Wyższym i Nauce "POL-on" ["POL-on" Integrated Information System on Higher Education and Science] are regulated by separate regulations.
4. The Code of Administrative Procedure shall apply accordingly to resolve individual cases in the scope not regulated by the Act or the Regulations.

# DIRECTOR OF THE DOCTORAL SCHOOL

Section 4

1. The Doctoral School is managed by the Doctoral School Director and their Deputy Director.
2. The Director is appointed by the Rector.
3. The Deputy Director is appointed by the Rector at the request of the Director of the Doctoral School.

Section 5

1. The tasks of the Director of the Doctoral School include in particular:
   1) proposing changes in the regulations of the Doctoral School;
   2) overseeing the entire functioning of the Doctoral School, in particular the correctness and quality of educational and scientific processes, and the manner of carrying out of the mid-term assessment;
   3) ensuring appropriate conditions for teaching at the Doctoral School, and in particular for the completion of internships in the form of teaching or assisting with teaching;
   4) managing, within the authorisation granted, the funds dedicated in the budget of the university in the financial plan for the functioning of the Doctoral School,

5) handling complaints of doctoral students in all matters relating to the Doctoral School not reserved for the competence of UTP bodies;
6) issuing administrative decisions concerning the recruitment process and the educational process at the Doctoral School, as defined in Section 26.
7) giving consent for doctoral students to undertake internships and conduct research in scientific institutions outside the entity running the Doctoral School, including support for grant activity and for the domestic and international mobility of doctoral students;
8) developing and publishing detailed rules and competitive recruitment procedures for admissions to the Doctoral School;
9) developing a curriculum for the Doctoral School;
10) cooperating with Scientific Discipline Councils in appointing a supervisor or supervisors, or a supervisor and an assistant supervisor;
11) cooperation with the self-governmental organisation of the doctoral students;
12) establishing the staffing for the implementation of the curriculum;
13) determining the composition of the Committee for the Mid-term Assessment of Doctoral Students;
14) preparing a self-evaluation report in Polish and English for the purposes of evaluating the quality of education;
15) entering, updating, archiving and erasing data in the Zintegrowany System Informacji o Szkolnictwie Wyższym i Nauce "POL-on" ["POL-on" Integrated Information System on Higher Education and Science];
16) supervising the collection of documentation on the process of education;
17) giving consent in the matters referred to in §10 and 12

2. The tasks of the Deputy of the Director of the Doctoral School include in particular:
   1) acting on behalf of the Director in their absence;
   2) completing other tasks commissioned by the Director.

## COUNCIL OF THE DOCTORAL SCHOOL

Section 6

1. A Council of the Doctoral School operates at the Doctoral School and acts as its consultative-advisory body.
2. The Doctoral School Council is appointed by the Rector at the request of the Director.
3. The Doctoral School Council is composed of:
   1) The Doctoral School Director as the Council's Head and the Deputy Director,
   2) Chairman of the Scientific Discipline Councils in which the education of doctoral students is conducted and a member appointed by them, who is an independent scientist and at the same time - if possible - an academic teacher participating in the education of doctoral students or who is a promoter of a doctoral dissertation,
   3) a representative of the doctoral students appointed by the self-governing body of the doctoral students.
4. The tasks of the Doctoral School Councils include in particular:
   1) giving opinions on detailed rules and competitive recruitment procedures for admissions to the Doctoral School;

1) giving opinions on the draft of the Regulations of the Doctoral School;
2) giving opinions on the curriculum of the Doctoral School;
3) giving opinions on candidates for the committee for mid-term evaluation of doctoral students at the Doctoral School;
4) giving opinions on the reports of the pro-quality systems;
5) providing opinions on the self-evaluation report for the purpose of evaluating the quality of education at the Doctoral School.

5. The Council shall issue opinions in the form of resolutions adopted by a simple majority of votes.

## RIGHTS AND OBLIGATIONS OF DOCTORAL STUDENTS

Section 7

1. The doctoral student has the right to:
   1) receive the scientific care of a supervisor or supervisors, or a supervisor and assistant supervisor in the preparation of a doctoral dissertation;
   2) change the supervisor or supervisors in justified cases;
   3) use laboratories, research equipment and apparatus, as well as library collections and IT resources to the extent necessary for the implementation of the curriculum, the personal research plan, and the preparation of a doctoral dissertation, pursuant to the rules laid down in separate legislation;
   4) extend the deadline for the submission of a doctoral dissertation, but for a maximum of two years;
   5) receive a doctoral scholarship, the total duration of which may not exceed four years, provided that they do not hold a doctoral degree. The monthly doctoral scholarship shall amount to:
      - 37% of the remuneration of a professor — up to the month of the mid-term assessment
      - 57% of a professor's remuneration, after the month of the mid-term assessment;
   6) complete internships;
   7) apply for accommodation in a student dormitory of a higher education institution or for a meal plan in the student canteen of the institution, pursuant to the rules laid down in separate regulations;
   8) apply for accommodation for their spouse or child in a student dormitory of a higher education institution pursuant to the rules laid down in separate legislation;
   9) take holiday leave of up to eight weeks per year;
   10) suspend their education for the reasons defined in Section 12;
   11) submit applications for reconsideration of cases for any administrative decisions issued;
   12) join doctoral student organisations or associations in the entity running the doctoral school;
   13) hold a doctoral student identity card.

Section 8

I. The doctoral student has the obligation to:

1) observe the provisions of these Regulations;
2) realise the curriculum and the personal research plan in a timely manner;
3) participate in the activities arising from the curriculum;
4) submit a personal research plan by 30 September of the first year of education together with the note of acceptance of the plan written by the supervisor or supervisors, or a supervisor and an assistant supervisor (Annex no. 3);
5) submit a report on the implementation of the personal research plan by 30 September of the 2nd 3 rd and 4th year of education, together with the opinion of the supervisor or supervisors or a supervisor and an assistant supervisor (Annex no. 3);
6) act in accordance with the oath;
7) act in accordance with the Code of Ethics for doctoral students;
8) submit a statement for the purpose of evaluating the quality of scientific activities, authorising the university to demonstrate scientific achievements in the discipline in which the doctoral dissertation is being prepared;
9) hold an electronic identifier of the researcher in accordance with the international standards;
10) report on the scientific achievements attained as the result of the doctoral programme for the purposes of evaluating the quality of scientific activities;
11) provide the Director of the School the mandatory information in order to be entered into the Zintegrowany System Informacji o Szkolnictwie Wyższym i Nauce "POL-on" ["POL-on" Integrated Information System on Higher Education and Science];
12) observe the rules and regulations on fire protection and occupational health and safety;
13) immediately notify the Director of the Doctoral School of any changes of name and address, as well as other personal data required by the university.

## MANNER OF APPOINTING AND CHANGING THE SUPERVISOR, SUPERVISORS, OR THE SUPERVISOR AND ASSISTANT SUPERVISOR

Section 9

1. A doctoral student shall submit an application (Annex no. 1) to appoint a supervisor or supervisors, or a supervisor and an assistant supervisor to the Scientific Discipline Council within 30 days from the date of commencing education.
2. A doctoral student may apply to the Scientific Discipline Council with an application (Annex no. 2) for changing the supervisor or supervisors, or a supervisor and an assistant supervisor.

3. The application referred to in paragraphs 1 and 2 includes, among others, the following:
   1) a proposition of a person or persons chosen for the position of the supervisor or supervisors, or the supervisor and an assistant supervisor;
   2) an express consent to become a supervisor or supervisors, or a supervisor and an assistant supervisor;
   3) a justification.
4. The application referred to in paragraphs 1 and 2 must be submitted to the Director of the Doctoral School
5. The Scientific Discipline Council shall appoint a supervisor or supervisors, or a supervisor and an assistant supervisor for the doctoral student within three months of the date of enrolment.

## CONDITIONS FOR EXTENDING THE TIME LIMIT FOR SUBMITTING THE DOCTORAL DISSERTATION

Section 10

1. The Director of the Doctoral School may, at the request of the doctoral student, extend the time limit for submitting the doctoral dissertation, as set out in the personal research plan, but not longer than 2 years, in justified cases, in particular:
   1) in the occurrence of unpredictable random events;
   2) due to a temporary incapacity to study due to illness;
   3) having a disability certificate;
   4) in case of the need to take personal care of an ill family member;
   5) in case of the need to take personal care of a child up to the age of four or a child with a certified disability;
   6) in case of problems in realising the personal research plan which are not attributable to the doctoral student.

Section 11

1. The application for extending the time limit for submitting the doctoral dissertation contains:
   1) personal data of the doctoral student: first and last names, PESEL number, and in case of lack of PESEL number — the number of a personal identification document and an indication of the current semester of the student,
   2) a justification with an indication of the expected date for the submission of the doctoral dissertation.
2. The application shall be appended by:
   1) a document justifying the extension of the time limit for submitting the doctoral dissertation — in the cases referred to in Section 10, subsection 1, points 1-5, or
   2) an opinion of the supervisor or supervisors, or of an assistant supervisor, in the cases referred to in Section 10, subsection 1, point 6.

Section 12

1. The Director of the Doctoral School shall, at the request of the doctoral student, suspend their education for a period corresponding to the duration of a maternity leave, leave on the terms of a maternity leave, a paternity leave, and a maternity leave as defined in the Act of 26 June 1974 —The Labour Code.
2. The Director of the Doctoral School may, at the request of the doctoral student, suspend their education on the grounds of a long-term illness, but longer than for one year.

Section 13

1. A written application in the cases referred to in Section 10 and Section 12 should be submitted by the doctoral student no later than 21 days from the date of occurrence of the circumstances.
2. The applications referred to in Section 10, subsection 1, Point 6 and in Section 12 shall be reviewed by the Director of the Doctoral School within 14 days of their submission.

## MANNER OF CONDUCTING THE MID-TERM ASSESSMENT

Section 14

1. The mid-term assessment shall be carried out after the fourth semester of the education and no later than 31 October.
2. The mid-term assessment envelops:
   1) the degree of implementation of the personal research plan by the doctoral student;
   2) the degree of implementation of the curriculum.
3. The mid-term assessment ends with either a positive or a negative result.
4. The result of the assessment and its justification shall be non-confidential.
5. The university operating the Doctoral School shall immediately publish the information about the results of the assessment together with their justifications in the Biuletyn Informacji Publicznej [Public Information Bulletin] on its website.
6. The doctoral student may appeal against the result of the mid-term assessment to the Director of the Doctoral School.
7. The time limit for lodging an appeal with a justification is 14 days from the date publishing the assessment results.
8. The Director shall review the appeals referred to in Point 6 within 14 days of their submission.

Section 15

1. The mid-term assessment shall be conducted by the Committee for the Mid-term Assessment of the Doctoral Students, hereinafter referred to as the Committee, consisting of three persons, including at least one person holding a post-doctoral degree or the title of professor in the discipline to which the dissertation pertains, employed from outside the entity operating the Doctoral School.

2. The Mid-term Assessment Committee for Doctoral Students shall be appointed by the Director in consultation with the Doctoral School Board.
3. The supervisor and an assistant supervisor may not be members of the Committee.
4. The mid-term assessment shall take place in presence the Committee, in the form of:
   1) a first-person narrative by the doctoral student reporting on the implementation of the personal research plan,
   2) a discussion during which the doctoral student is asked questions,
   3) a discussion on the doctoral student's annual report on the implementation of the research plan,
   4) a discussion on the opinion of the supervisor or supervisors,
   5) a discussion on the progress of education,
   6) determining the result of the mid-term assessment.

   Parts 1, 2, 3 and 6 are conducted without the participation of a doctoral student.

## PRINCIPLES OF EDUCATION

Section 16

1. The admissions to the doctoral school are made by way of registration on the list of doctoral students.
2. A doctoral student commences their education and acquires doctoral student rights upon taking the oath.
3. A doctoral student may be admitted to only one doctoral school at a time.
4. No fees shall be charged for teaching doctoral students at the Doctoral School.
5. The following persons may participate in the teaching of doctoral students: a) pursuant to Article 115, point 1 of the Act of 20 July 2018 Law on Higher Education and Science, academic staff who are research staff, research and development staff or teaching staff, and b) specialists from the socio-economic environment.
6. Education at the Doctoral School is conducted in Polish and in English.

Section 17

1. The academic year runs from 1 October to 30 September and is divided into 2 semesters.
2. The education of the doctoral students in the Doctoral School:
   1) is stationary and lasts 8 semesters;
   2) is conducted on the basis of the curriculum and the individual research plan;
   3) prepares for promotion to the doctoral degree;
   4) ends with the submission of the doctoral dissertation.
3. The condition for completing a year of education is:
   1) obtaining credit and passing exams provided for in the curriculum for the given year,

2) in the first year of education, submission of a personal research plan (Annex no. 3) by 30 September together with the acceptance note of this plan by the supervisor or supervisors or the supervisor and an assistant supervisor,
3) in the 2nd, 3rd and 4th year of education, submitting a report on the implementation of the personal research plan (Annex 3) by 30 September, together with the opinion of the supervisor or supervisors, or the supervisor and an assistant supervisor.

4. The doctoral student shall not have the right to repeat a year or to resume education after their removal from the list of doctoral students for the reasons set out in Section 23, Points 1.1, 1.2, 2.1 and 2.2.
5. In the case a doctoral student fails to obtain credit for one subject within the specified time limit in the given academic year, the Director of the Doctoral School may issue a decision on conditional permission for the student to continue education in the following year. A doctoral student who failed to complete a course in the given year is obliged to complete that course no later than in the next academic year in which they resume their education.

Section 18

1. A doctoral student of a Doctoral School operated by an entity other than UTP, after having completed at least the first assessment period, may continue their education at the UTP Doctoral School, subject to the consent of the Director issued after consultation with the supervisor.
2. The Director shall qualify the candidate for admission by way of transfer, specifying the scope and deadlines for making up for differences between the curriculums.
3. The person qualified shall be entered on the list of doctoral students of the Doctoral School after submitting an application to be removed from the doctoral school from which they are transferred, and after taking the oath referred to in Section 16, Point 2.
4. A doctoral student, having previously fulfilled all their obligations towards the UTP Doctoral School, may move to a doctoral school operated by another entity.

Section 19

1. The curriculum shall be adopted by resolution of the Senate while observing the requirement to consult the self-governmental body of the doctoral students. Should the time limit laid down in the Bylaws expire ineffectively, the requirement to consult the self-governmental body of the doctoral students shall be deemed to have been met.
2. The curriculum may provide for internships in the form of teaching or participation in teaching, not exceeding 60 teaching hours per year.

Section 20

1. The personal research plan of the doctoral student specifies in particular:
   1) the proposed title of the dissertation, research objectives or research hypotheses, time frame for the preparation of the dissertation, including a research schedule, expected results, and the date of submission of the dissertation;
   2) the planned date of submitting at least 1 scientific article for print in a scientific journal or peer-reviewed materials from an international conference which, in the year of publication of the article in its final form, were included in the list drafted in accordance with regulations based on Art. 267, Sec. 2, Clause 2, Letter b of the Act of 20 July 2018 — The Law on Higher Education and Science, or 1 scientific monograph issued by a publisher which, in the year of publishing the monograph in its final form, was included in the list drafted in accordance with regulations based on Art. 267, Sec. 2, Clause 2, Letter b of the Act of 20 July 2018 —The Law on Higher Education and Science, or a chapter of such a monograph.
   3) participation in a scientific conference — domestic or international;
   4) submission of a research grant application at a domestic or foreign research funding agency by means of grant competition;
   5) undertaking an at least one-month-long scientific internship at a domestic or foreign university or scientific institution, or an at least one-week-long study tour to a domestic or a foreign university or scientific institution.
2. The doctoral student may apply to the Director of the Doctoral School to change their Personal Research Plan once in the course of their education. The application should include a justification, an amended Personal Research Plan, and a note of approval from the supervisor or supervisors.

Section 21

Individual course of education

1. The Doctoral School provides for an Individual Course of Education (ITK), consisting in the individual determination of: the education program, education plan, and possible exemption from participation in certain classes.
2. A doctoral student who will be a contractor of a research project obtained through a competition and financed from external sources, or when he is planning a research internship may apply for ITK
3. The doctoral student together with the supervisor and after the approval of the teachers, presents the project of the ITK to the Director, who agrees to its implementation
4. The ITK includes in particular the education plan and the Learning Outcomes Compliance with the level 8 within the Polish Qualifications Framework

Section 22

Pro quality system

1. The Doctoral School has a pro-quality system which includes:
   1) Motivation system for doctoral students
   2) System for improving quality of teaching
2. As part of the motivation system for doctoral students:

1) The Doctoral School Director increases 20% of doctoral students in each year of the due doctoral scholarship by 20% of its value
2) The scholarship is increased for one year
3) The list of increased scholarship holders, is created based on the average of the grades obtained in the previous academic year. In the event that it is not possible to select the list of doctoral students on the basis of the average assessment, the Director supports the reports on the implementation of IPB or the ranking list of the recruitment process in the case of doctoral students of the first year

3. As part of the system for improving quality of teaching
   1) The Director prepares an annual report based on the analysis of doctoral student surveys, assessments, mid-term evaluation results, the number of withdrawals from the list of doctoral students and the number of promoted doctors.
   2) The Doctoral School Council reads the report and makes recommendations for the Director in relation to the curriculum and plan of education.
   3) The Director might order the classes to be visited.

Section 23
Removals

1. The doctoral student shall be removed from the list of doctoral students in the case of:
   1) negative result on the mid-term assessment;
   2) failure to submit the doctoral dissertation within the time limit specified in the personal research plan;
   3) withdrawal from the course.
2. The doctoral student may be removed from the list of doctoral students in the case of:
   1) unsatisfactory progress in the preparation of the doctoral dissertation;
   2) failure to meet the obligations arising from the regulation of the Doctoral School relating to the realisation of the curriculum and implementation of the personal research plan..
3. Removal from the list of doctoral students is an administrative decision. The appeal procedure has been defined in Section 26 of the Regulations.
4. A doctoral student who has been removed from the list of doctoral students shall cease to receive the doctoral scholarship on the first day of the month following the month in which the decision to remove them from the list of doctoral students became final.

Section 24

1. In the event that teaching in one or more of the disciplines for which education is provided at the Doctoral School shall be discontinued, the entity operating the Doctoral School shall provide the doctoral students preparing their doctoral dissertations in those disciplines with the opportunity to continue their education at another doctoral school in those disciplines.

2. In the absence of a doctoral school providing education in those disciplines, the entity operating the doctoral school where education is being discontinued shall cover the costs of proceedings for the award of a doctoral degree by way of an extramural course for persons who have otherwise lost the opportunity to complete their education.

## MANNER OF DOCUMENTING THE EDUCATIONAL PROGRESS

Section 25

1. The Doctoral School maintains documentation of the educational progress.
2. The documentation of the educational progress at the Doctoral School consists of:
   1) a register of doctoral students;
   2) personal data files of the doctoral students;
   3) a record of periodic achievements of the doctoral students;
3. The documentation of the educational progress at the Doctoral School is held electronically.

## DECISSIONS

Section 26

1. The Director of the Doctoral School:
   1) makes entries on the list of doctoral students;
   2) issues administrative decisions:
      a) on refusal of admission to the Doctoral School;
      b) on removal from the list of doctoral students.
2. Pursuant to Art. 200, Point 5 and Art. 203, Point 3 of the Act of 20 July 2018 on Law on Higher Education and Science, the decisions referred to in Subsection 1, Point 2, may be appealed with an application for case reconsideration.
3. The application referred to in Point 2 shall be submitted to the Director of the School no later than fourteen days from the date of receiving the decision.

Annex no. 1 to the Regulations of the Doctoral School
of the Bydgoszcz University of Science and Technology

Bydgoszcz, on ……

……
first and last names of the doctoral students

……
register no.

……
phone no.

……
email address

**THE SCIENTIFIC DISCIPLINE COUNCIL**

- **AUTOMATION, ELECTRONICS AND ELECTRICAL ENGINEERING,**
- **CIVIL ENGINEERING, GEODESY AND TRANSPORT,**
- **INFORMATION TECHNOLOGY AND TELECOMMUNICATION,**
- **MECHANICAL ENGINEERING,**
- **CHEMICAL SCIENCES,**
- **AGRICULTURE AND HORTICULTURE,**
- **ANIMAL SCIENCE AND FISHERIES/***

# *APPLICATION*

I hereby request the following person/s to be appointed as my doctoral dissertation supervisor / supervisors* and assistant supervisor*:

1. supervisor
   ……
   (first and last names, scientific degree or title)
2. supervisor
   ……
   (first and last names, scientific degree or title)
3. assistant supervisor
   ……
   (first and last names, scientific degree or title)

Justification:

……
……
……
……

Please find attached the written declarations of consent of the above persons to taking the responsibility of supervising my project.

……
(legible signature of the doctoral student)

The opinion of the Director of the Doctoral School:

……
……
……
……

……
(signature of the Director of the Doctoral School)

*delete as appropriate

Annex no. 2 to the Regulations of the Doctoral School
of the Bydgoszcz University of Science and Technology

…… Bydgoszcz, on ……
first and last names of the doctoral students

……
register no.

……
phone no.

……
email address

**THE SCIENTIFIC DISCIPLINE COUNCIL**

- **AUTOMATION, ELECTRONICS AND ELECTRICAL ENGINEERING,**
- **CIVIL ENGINEERING AND TRANSPORT,**
- **INFORMATION TECHNOLOGY AND TELECOMMUNICATION,**
- **MECHANICAL ENGINEERING,**
- **CHEMICAL SCIENCES,**
- **AGRICULTURE AND HORTICULTURE,**
- **ANIMAL SCIENCE AND FISHERIES/***

# *APPLICATION*

I hereby request for my doctoral dissertation supervisor / supervisors* and assistant supervisor* to be changed for the following person/s:

1. supervisor
   ……
   (first and last names, scientific degree or title)
2. supervisor
   ……
   (first and last names, scientific degree or title)
3. assistant supervisor
   ……
   (first and last names, scientific degree or title)

Justification:

……
……
……
……

Please find attached the written declarations of consent of the above persons to taking the responsibility of supervising my project.

……
(legible signature of the doctoral student)

The opinion of the Director of the Doctoral School:

……
……
……
……

……
(signature of the Director of the Doctoral School)

*delete as appropriate

Annex no.3 to the Regulations of the Doctoral School

of the UTP University of Science and Technology in Bydgoszcz

*First and the last names of the Doctoral student*

First and last names.

*Register number*

Register number.

*Data of issue*

Click to enter the date.

**Director of the Doctoral School**
**of the UTP University of Science and**
**Technology in Bydgoszcz**

# Personal Research Plan and report on its implementation

## of a Doctoral student at the Doctoral School of the UTP University of Science and Technology in Bydgoszcz

| Submitting the Personal Research Plan | Submitting the report on implementation of the Personal Research Plan | | |
|---|---|---|---|
| Year I | Year II | Year III | Year IV |
| X | | | |

## 1. Characteristic of the doctoral dissertation

*Field of science and discipline of the dissertation*

Field of science and scientific discipline

*Supervisor or supervisors, or supervisor and co – supervisor*

State personal details of the supervisors

*Proposed dissertation title*

Proposed dissertation title

*Research objectives or a hypothesis*

Objectives or hypothesis

*Expected results, contribution to the development of the discipline*

Describe the expected results of the research

## 2. The time frame of the Personal Research Plan

| Assignment number | Academic year | Due date | Assignment description | Estimation of the assignment progression |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| | | | | |
| | | | | |
| | IV | May 2024 | Submission of the doctoral dissertation | |

## 3. Instruction for formulating the time framework of the Personal Research Plan

3.1 The time frame must include assignments related to the realisation of the research plan and development of the doctoral dissertation.

*For each entry in the time frame the student needs to provide the name of the research assignment or the organisational undertaking, the purpose, the substance, the means of realisation, the methods and tools utilised, the expected effects of the assignment or undertaking, and the sources of funding.*

3.2 The time frame must include at least one assignment of each of the following list of mandatory assignments:

a. The planned date of submitting at least 1 scientific article for print in a scientific journal or peer-reviewed materials from an international conference which, in the year of publication of the article in its final form, were included in the list drafted in accordance with regulations based on Art. 267 Sec. 2 Clause 2 letter b of the Act of 20 July 2018 — The Law on Higher Education and Science (Journal of Laws 2018, item 1668), or 1 scientific monograph issued by a publisher which, in the year of publishing the monograph in its final form, was included in the list drafted in accordance with regulations based on Art. 267 Sec. 2 Clause 2 letter b of the Act of 20 July 2018 — The Law on Higher Education and Science (Journal of Laws 2018, item 1668), or a chapter of such a monograph.

*Please state the name of the journal, the number of points, and the date of publication*

b. Active participation in a domestic or an international scientific conference

*Please state the name of the conference, the date of the conference, the form of the presentation (poster, oral presentation), and the sources of funding*

c. Submission of a research grant application at a domestic or foreign research funding agency by means of grant competition

*Please state the name of the research funding agency, the name of the competition, the title of the project, and the date of submitting the application*

d. Information on an at least one-month-long scientific internship at a domestic or foreign university or academic institution, or an at least one-week-long study tour to a domestic or a foreign university or academic institution

*Please provide the name of the university or the academic institution, the length of stay, the scientific objectives of the tour, and the sources of funding*

e. Submission of the doctoral dissertation

*Please state the date of submission of the doctoral dissertation*

3.3 The time frame may also include other, non-mandatory scientific goals

*Please list any other scientific goals, e.g.: participation in co-organising of a domestic or international scientific conference, distribution of research-and-development results on an open access basis.*

| Signature of the Doctoral student | Signatures of the supervisor or supervisors, or of a supervisor and co-supervisor |
|---|---|

POLITECHNIKA
BYDGOSKA
im. Jana i Jędrzeja Śniadeckich

# Resolution No. 14/479
## Senate
## Bydgoszcz University of Science and Technology
of 22 March 2023

**on the adoption of the Regulations No. 4 of the Doctoral School of the Bydgoszcz University of Science and Technology**

Based on:

- § 20 section 7 of the Statute of the Bydgoszcz University of Science and Technology (i.e. introduced by Resolution No. 1/460 of the Senate of the Bydgoszcz University of Science and Technology of 14 July 2021) in conjunction with Article 205 sections 2 and 4 of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2022, item 478 as amended. as amended[1]);

*Senate*
*Bydgoszcz University of Science and Technology*
*resolves as follows:*

**§ 1**

The Regulations No. 4 of the Doctoral School of the Bydgoszcz University of Science and Technology, attached to this resolution, are hereby adopted.

**§ 2**

Resolution No. 2/453 of the Senate of the UTP of 20 January 2021 on the adoption of the Regulations of the Doctoral School of the Bydgoszcz University of Science and Technology is repealed.

**§ 3**

The resolution enters into force on October 1, 2023.

President of the Senate
Rector

Prof. Marek ADAMSKI

[1] Amendments: of 2022, items 583, 655, 682, 807, 1010, 1079, 1117, 1459, 2185, 2306, of 2023, item 212

Appendix to the Resolution of the PBS Senate No. 14/479
of March 22, 2023.

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# REGULATIONS No. 4
# OF THE DOCTORAL SCHOOL

# BYDGOSZCZ UNIVERSITY
# OF SCIENCE AND TECHNOLOGY

Take effect from October 1, 2023

Bydgoszcz 2023

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## GENERAL PROVISIONS

### § 1

1. Regulations of the Doctoral School of Bydgoszcz University of Science and Technology, hereinafter referred to as the "Doctoral School," define the organization of education and the rights and obligations of doctoral students and candidates related to education at this school.

2. The Doctoral School is run by Bydgoszcz University of Science and Technology, hereinafter referred to as "the University."

3. The Doctoral School may provide education in scientific disciplines in which the University is authorized to award doctoral degrees.

## LEGAL BASIS AND DEFINITIONS

### § 2

1. The Doctoral School of Bydgoszcz University of Science and Technology is conducted based on applicable regulations, in particular:
   1) The Act of July 3, 2018: Provisions introducing the Act: Law on Higher Education and Science;
   2) the Act of July 20, 2018: Law on Higher Education and Science, hereinafter referred to in Polish as PSWiN;
   3) the Statute of Bydgoszcz University of Science and Technology.
2. Whenever the text of Regulations refers to:
   1) the University, it refers to Bydgoszcz University of Science and Technology;
   2) the Rector, it refers to the Rector of the University;
   3) the Statute, it refers to the Statute of the University;
   4) the Doctoral School it refers to the Doctoral School of Bydgoszcz University of Science and Technology;
   5) the Council, it refers to the Council of the Doctoral School of Bydgoszcz University of Science and Technology;
   6) the Committee, it refers to the Committee for the mid-term evaluation of doctoral students and candidates;
   7) the Head, it refers to the Head of the Doctoral School.

## PRINCIPLES OF EDUCATION

### § 3

### General Provisions

1. The education of doctoral students and candidates at the Doctoral School prepares them to obtain a doctoral degree. It is conducted following an educational programme and an Individual Research Plan, hereinafter referred to as "the IRP."
2. Admission to the Doctoral School takes place by way of entry on the roll of doctoral students.
3. Foreigners are admitted to the Doctoral School and removed from the roll of doctoral students and candidates by way of an administrative decision issued by the Rector.

4. Upon taking the oath, a doctoral student begins education and acquires doctoral student rights. Failure to take the oath within two weeks of the commencing of the academic year or the nearest semester after the end of the classification procedure or the date of admission to the Doctoral School specified by the Head is equivalent to not undertaking the education referred to in Article 203, Paragraph 1, Point 4 of PSWiN and results in removal from the roll of doctoral students and candidates.
5. A person can be a doctoral student at only one doctoral school at a time.
6. Education of doctoral students and candidates at the Doctoral School is free of charge.
7. The following may participate in the education of doctoral students and candidates:
   1) academic teachers who are members of research, research and teaching or teaching staff;
   2) specialists from the socio-economic environment.
8. Education at the Doctoral School is conducted in Polish and English.

## § 4

## Education Programme

1. The education programme at the Doctoral School ensures the achievement of learning outcomes for qualifications at the eighth level of the Polish Qualifications Framework (PQF).
2. The education programme is adopted by the Senate, course to the requirement to seek the opinion of the doctoral students and candidates' Council. If the closing date specified in the Statute expires to no avail, the requirement to seek an opinion is deemed to have been met.
3. In the case of courses elective by doctoral students and candidates, education is started by the decision of the Head, who makes the decision based on the number of applicants. The doctoral student submits a declaration regarding the selected courses to the Doctoral School no later than thirty days before the beginning of the semester in which the block of elective courses is planned to be completed.
4. The education programme provides for professional internships in the form of conducting classes or participating in them for up to 60 teaching hours.

## § 5

## Academic Year and Its Completion

1. The education of doctoral students and candidates at the Doctoral School lasts four years.
2. The academic year lasts from October 1 to September 30 and is divided into two semesters. The Rector determines the academic year's schedule and organization through an ordinance.
3. The condition for passing a semester of education is:
   1) obtaining all credits and passing all exams provided for in the education programme for a given semester;
   2) in the second semester of education, submitting the IRP and the report on its implementation (Appendix N$^{o.}$ 1) by September 30;
   3) in the 4th, 6th and 8th semester of education, submitting a report on the implementation of the IRP (Appendix N$^{o.}$ 1) by September 30.
4. Examinations or credit tests take place on the dates of examination sessions and retake sessions specified by the Rector's regulation referred to in Paragraph 2.
5. The following grading scale is used for course tests and examinations depending on the degree of achievement of learning outcomes:
   1) very good – 5.0;

2) good plus – 4.5;
3) good – 4.0;
4) sufficient– 3.5;
5) satisfactory – 3.0;
6) insufficient/fail – 2.0.

6. In the event of an unexcused absence for 1/3 of the course hours in a semester, the instructor is obliged to inform the Head about this fact, who may decide to remove the doctoral student from the roll of doctoral students and candidates.
7. If a doctoral student's unexcused absence from a test or examination within the prescribed period, they receive an entry in the course completion report: "did not take the exam."
8. After receiving an unsatisfactory grade in an examination or a credit test, the doctoral student has the right to retake one exam or credit course.
9. The doctoral student has no right to repeat the semester or resume education after being removed from the roll of doctoral students and candidates for the reasons specified in § 11, Paragraphs 1 and 2.
10. Failure to obtain a credit or fail an examination in one or more courses in a given semester may constitute grounds for removal from the doctoral students and candidates list.
11. In the event of failure to obtain credits or fail an examination in one course, the Head, at the request of the doctoral student, may consent to conditional continuation of education in the following semester. A doctoral student is obliged to obtain credit from this course no later than by the end of the semester in which they conditionally continue education.
12. Sign language interpreters and assistants for people with special needs may participate in assessments and examinations. Persons helping doctoral students and candidates with special needs should have the consent of the Head to participate in examinations and tests.
13. Doctoral students and candidates with special needs, no later than seven days before the start of the examination and retake session, may apply to the course coordinator for:
    1) adjusting the dates of examinations or credit tests to their needs;
    2) changing the form of a credit test or an examination from written to oral or vice versa;
14. during the academic year, the Rector may establish days or hours free from teaching for doctoral students and candidates of the Doctoral School.
15. The timetable is made available to doctoral students and candidates in the Doctoral Student Service IT System no later than two days before the beginning of the semester.

## § 6

## Individual Research Plan

1. The doctoral student prepares the IRP in consultation with the supervisor or supervisors.
2. If an assistant supervisor is appointed, the plan is presented after the opinion of this supervisor.
3. The IRP project is a course to be reviewed by the relevant Scientific Council of the Discipline. The written opinion of the Scientific Council of the Discipline is forwarded to the doctoral student and the supervisor.
4. The doctoral student's IRP specifies in particular:
   1) proposed title of the doctoral dissertation, research objectives, research program, expected results, schedule for the preparation of the doctoral dissertation, including the closing date for submitting the dissertation;
   2) the date of publication of at least one scientific article in a scientific journal or in peer-reviewed materials from an international conference, which in the year of publication of the article in its final form was included in the list prepared following the regulations issued

under Article 267, Paragraph 2, Point 2, Letter b of PSWiN or one scientific monograph published by a publishing house which, in the year of publication of the monograph in its final form, was included in the list prepared following the regulations issued under Article 267, Paragraph 2, Point 2 letter a of PSWiN or a chapter in such a monograph;
3) date of active participation in the scientific conference;
4) closing date for submitting a grant application to the agency financing scientific activities through a competition;
5) the date of completing a research internship or study trip at another university or scientific institution, which cannot be shorter than 1 week or longer than 1 semester.

5. After the mid-term evaluation, the doctoral student may apply to the Head once to change the IRP.
6. In particularly justified cases, the Head of the Doctoral School may consent to change the IRP other than that specified in Paragraph 5.
7. The application referred to in Paragraphs 5 and 6 should include a justification, the amended IRP and the consent of the supervisor or supervisors. The application should include their opinion if an assistant supervisor has been appointed.

## § 7

## Individual Course of Study

1. The Doctoral School provides for an Individual Course of Study (ICS), which involves individually determining the education program and the possibility of exempting a doctoral student from participating in certain classes.
2. A doctoral student who is the manager or contractor of a research project obtained through competition and financed from external sources or is planning a one-semester research internship may apply for the ICS.
3. The doctoral student and their supervisor present the ICS project to the Head, who may consent to its implementation.
4. The ICS documentation must include its rationalization, the educational program, and, in particular, the matrix of compliance with the learning outcomes for PQF Level 8.
5. All learning outcomes for PQF Level 8 must be covered in ICS.
6. The doctoral student may apply to obtain ICS immediately, no later than two weeks after the occurrence of the circumstances indicated in Paragraph 2.

## § 8

## Pro-Quality System

1) The Doctoral School operates a pro-quality system, which includes:
   1) motivational system for doctoral students and candidates;
   2) system for improving the quality of classes.
2) As part of the motivational system for doctoral students and candidates:
   1) after obtaining the consent of the Rector, the Head may increase the amount of the doctoral scholarship by 20% to up to 20% of the number of doctoral students and candidates of a given year and language group;
   2) when calculating the number of doctoral students and candidates who are entitled to an increased scholarship, the result of calculating the number of entitled persons is rounded down;

3) the scholarship is increased for a period of one year;
4) when creating the roll of scholarship holders, the Head is guided by the average grade (up to four decimal places) accomplished in the previous academic year. If selecting a roll of doctoral students and candidates following their grade point average is not possible, the Head takes into consideration the reports on the implementation of the IRP or a ranking roll of the recruitment process;
5) the increase in the scholarship does not apply to doctoral students and candidates in the first year of education and doctoral students and candidates pursuing ICS;
6) doctoral students and candidates who have obtained a negative result of the mid-term evaluation and those subject to administrative proceedings regarding removal from the roll of doctoral students and candidates are not entitled to an increase in the scholarship.

3) As part of the system for improving the quality of classes:
1) class inspections are carried out following the internal regulations of the University;
2) each semester, doctoral students and candidates evaluate teaching activities following the internal regulations of the University;
3) the Head prepares an annual report on the quality of education, including analyses: doctoral student surveys, course observations, grades obtained by doctoral students and candidates, results of mid-term evaluation, removals from the roll of doctoral students and candidates and promoted doctors;
4) the Council reads the report and recommends to the Head regarding the educational programme and staffing for doctoral students and candidates;
5) persons applying to teach at the Doctoral School must receive a positive opinion from the Council based on documented professional endeavours over the previous five years. Professional undertakings are shown in the profile of the tutor of the Doctoral School (Appendix N$^{o}$ 2).

## § 9

## Education in Cooperation with Other Research Centers

1. A doctoral student may complete part of their educational process at another university or scientific institution.
2. The Head decides on the conditions for crediting the period of education completed at another university or scientific institution, taking into account the transfer and recognition of credited classes and the implementation of IRP following applicable regulations.
3. Doctoral students and candidates from other doctoral schools may participate in education at the Doctoral School.
4. The Head decides on the possibility of participating doctoral students and candidates referred to in Paragraph 3 in classes, considering the recognition of completed classes and the implementation of IRP following applicable regulations.
5. Education jointly with a foreign center may be carried out based on an agreement.
6. At the request of a doctoral student from a non-domestic university or scientific institution pursuing part of their education at the Doctoral School, they are issued a doctoral Student ID.

## § 10

## Transfers

1. A doctoral student at a Doctoral School run by an entity other than the University may be admitted to the Doctoral School only through recruitment.
2. Commencing education at the Doctoral School is possible after resigning from education at another Doctoral School.
3. Based on the obtained learning outcomes, the Head decides on the semester the doctoral student begins their education.

## § 11

## Deletions

1. A doctoral student is removed from the roll of doctoral students and candidates in the event of:
   1) a negative result of the mid-term evaluation;
   2) failure to submit the doctoral dissertation within the closing date specified in the IRP;
   3) waiving one's education;
   4) not taking up education;
   5) violation of the prohibition referred to in Article 200, Paragraph 7 and Article 209, Paragraph 10 of PSWiN;
   6) being punished with a disciplinary penalty of expulsion from the Doctoral School.
2. A doctoral student may be removed from the roll of doctoral students and candidates in the event of:
   1) unsatisfactory progress in the preparation of the doctoral dissertation;
   2) failure to fulfill the obligations arising from the regulations of the PBS Doctoral School, implementation of the educational programme and IRP.
3. Resignation from education takes place at the written request of the doctoral student.
4. The supervisor may apply together with a justification to remove the doctoral student from the roll of doctoral students and candidates due to unsatisfactory progress in preparing the doctoral dissertation.
5. Subject to § 3, Paragraph 3, removal from the roll of doctoral students and candidates takes place by way of an administrative decision of the Head.
6. The appeal procedure is specified in § 25.
7. A doctoral student who has been removed from the roll of doctoral students and candidates shall cease to be paid a doctoral scholarship as of the first day of the month following the month in which the decision to be removed from the roll of doctoral students and candidates became final.
8. Within fourteen days from the date of deletion:
   1) the doctoral student is obliged to settle all liabilities towards the University, which is confirmed by the clearance slip;
   2) the Head shall notify the Chair of the relevant Scientific Council of the Discipline about the deletion.

## § 12

## Suspension of Education, Absences

1. At the request of a doctoral student, the Head suspends education for a period corresponding to the duration of maternity leave, leave under the terms of maternity leave, and paternity leave specified in the Act of June 26, 1974: Labor Code.
2. The Head, at the request of the doctoral student, may suspend education due to long-term illness for a period not longer than one year.
3. The suspension period of education for the reason referred to in Paragraph 2 is included in the four years of receiving the scholarship referred to in § 20, Paragraph 5.
4. During the suspension of the education period at the Doctoral School, the closing dates specified in the IRP do not run.
5. The doctoral student is obliged to submit a declaration of commencement of suspended education within two weeks from the end of the period of suspension of education. Failure to submit the declaration within this period is considered a failure to undertake the education referred to in Article 203, Paragraph 1, Point 4 of PSWiN and results in removal from the roll of doctoral students and candidates of the Doctoral School.
6. The Head, at the request of the doctoral student, may consent to the use of rest leaves not exceeding eight weeks a year. Rest leaves are taken during periods free from teaching classes. Each break cannot be shorter than seven days unless the doctoral student's request states otherwise.
7. The dates of rest leaves must be agreed with the supervisor or supervisors in a way that enables the fulfillment of obligations, considering the regulations referred to in § 5, Paragraph 2.
8. Failure of the doctoral student to justify the absence referred to in § 5, Paragraphs 6 and 7 constitute the basis for deletion from the roll of doctoral students and candidates. The absence of a doctoral student due to illness must be documented with a sick leave.
9. The doctoral student is obliged to immediately inform the Doctoral School about absences caused by a research internship, study trip or participation in a conference.
10. If the doctoral student's justified absence occurs during teaching classes, an examination session or a retake session, the doctoral student must make up the arrears in agreement with the course instructor and within the closing dates specified in the order referred to in § 5, Paragraph 2.

## § 13

## Completion of Education

1. Education at the Doctoral School ends with submitting a doctoral dissertation.
2. The condition for submitting a doctoral dissertation is to meet the requirements specified in Article 186, Paragraph 1, Points 1, 2, 3 and 5 of PSWiN and the implementation of all IRP tasks.
3. Submitting the dissertation means entering it into the Diploma Theses Archive system (APD) and accepting it by the supervisor.
4. In the case of written works, the supervisor's approval takes place after analyzing the result of the dissertation examination using the Uniform Anti-plagiarism System (JSA).
5. The Doctoral School enters the data of the doctoral dissertation into the USOS system and the electronic version of the doctoral dissertation submitted by the doctoral student into the APD system.

6. Completion of education is confirmed by a certificate (Appendix N$^{o.}$ 3).
7. The certificate of completion of education includes a statement on obtaining or not achieving learning outcomes for qualifications at PQF level 8, information on the average grade for the entire course of education, courses completed by the doctoral student along with the grades obtained and a reference to the learning outcomes at PQF level 8.

**§ 14**

**Termination of Education**

1. If the education of doctoral students and candidates in a given discipline is discontinued, the University provides doctoral students and candidates preparing a doctoral dissertation in this discipline with the opportunity to continue their education at another doctoral school in this discipline.
2. If a doctoral student is unable to undertake education at another doctoral school in a given discipline, the University shall bear the costs of proceedings for awarding a doctoral degree on an extramural basis for doctoral students and candidates who have lost the opportunity to complete their education.

## MODE OF DESIGNATING AND CHANGING the SUPERVISOR, SUPERVISORS OR a SUPERVISOR AND ASSISTANT SUPERVISOR

**§ 15**

1. Within thirty days from the date of commencement of training, the doctoral student shall apply to the Scientific Council of the Discipline (Appendix N$^{o.}$ 4) to appoint a supervisor or supervisors or a supervisor and an assistant supervisor.
2. Within three months from the commencement of education, the relevant scientific Council of the discipline appoints a supervisor or supervisors, or a supervisor and an assistant supervisor, for the doctoral student. The Council prepares a notification of the appointment of a supervisor/assistant supervisor (Appendix N$^{o.}$ 5) and forwards it to the School and the Science and Evaluation Department.
3. A doctoral student may submit a request to the Scientific Council of the Discipline to change the supervisor or supervisors or the supervisor and assistant supervisor (Appendix N$^{o.}$ 6).
4. A doctoral student may apply to the Scientific Council of the Discipline (Appendix N$^{o.}$ 4) to appoint a second or assistant supervisor.
5. A doctoral student may submit a request to the Scientific Council of the Discipline to dismiss the supervisor if two supervisors were previously appointed or a request to dismiss the assistant supervisor if an assistant supervisor was previously appointed. The application must include justification.
6. If the supervisor is no longer able to perform their responsibilities, in particular, due to their death or long-term illness or resignation from the position of supervisor, the doctoral student is obliged to apply for a change of supervisor immediately. The application and the current supervisor's resignation are forwarded to the appropriate Scientific Council of the Discipline for further processing.
7. A resolution on the matters referred to in Paragraph 3-6 disciplines are taken up by the Scientific Council immediately. The provision of Paragraph 2 in the part regarding the submission of notification by the Council shall apply accordingly.

8. The applications referred to in Paragraphs 1, 3, 4 and 6 must contain the following:
   1) proposal of the person or persons of the supervisor or supervisors, or the supervisor and assistant supervisor;
   2) consent to assume the function of supervisor or supervisors, or supervisor and assistant supervisor;
   3) justification.
9. The Head must approve the applications referred to in Paragraphs 1, 3-6.
10. When appointing a supervisor, the Scientific Council of the Discipline is guided by the following premises:
    1) directions of development of the scientific discipline;
    2) the scientific development needs of the candidate for supervisor;
    3) current scientific achievements of the candidate for supervisor;
    4) the current involvement of the candidate for supervisor in the organizational and teaching activities of the unit.
11. The competent Council shall terminate the status of a supervisor or assistant supervisor if a doctoral student is removed from the roll of doctoral students and candidates. The resolution on dismissal may not be adopted earlier than six months from the date the decision on deletion became final.
12. In the event of the death of a doctoral student or resignation from education, at the written request of a doctoral student at the Doctoral School, the resolution referred to in Paragraph 11 shall be undertaken immediately.
13. In the event of punishing the supervisor or assistant supervisor with a disciplinary penalty referred to in Article 276 of PSWiN or in another particularly justified case, the Scientific Council of the Discipline has the right to replace them.

## MODE OF CONDUCTING MID-TERM EVALUATION

### § 16

### Conditions for Carrying Out the Mid-Term Evaluation

1. The mid-term evaluation is carried out after the fourth semester of the education period, no later than October 31.
2. In particularly justified cases, the mid-term evaluation may be carried out using remote communication methods and techniques.
3. By September 30 of the academic year preceding the academic year in which the mid-term evaluation will take place, the doctoral student course to mid-term evaluation is obliged to submit a report on the implementation of the IRP and the opinion of the supervisor or supervisors or the supervisor and assistant supervisor (Appendix No. 1).
4. The doctoral student's implementation of the IRP is subject to mid-term evaluation.
5. The mid-term evaluation ends with a positive or negative result.
6. The evaluation result and justification are public.
7. The University immediately provides information on the mid-term evaluation results and its justification in its website's Public Information Bulletin.
8. The doctoral student may appeal against the mid-term evaluation results to the Head of the Doctoral School.
9. The closing date for submitting an appeal together with justification is 14 (fourteen) days from the date of making the assessment results available.

10. The Head considers the appeals referred to in Point 7 no longer than within 30 (thirty) days from their submission date. The Head's decision is final.

**§ 17**

**The Mid-Study Evaluation Committee and Its Course**

1. The mid-term evaluation is carried out by a committee composed of three persons, including at least one person holding a habilitation degree or the title of professor in the discipline in which the doctoral dissertation is being prepared, employed outside the entity running the Doctoral School or a person referred to in Article 190, Paragraph 5.
2. The Committee is apppointed by the Head from among the candidates indicated by the Scientific Councils of the disciplines after obtaining an opinion from the Council.
3. The supervisor and assistant supervisor cannot be members of the Committee.
4. The work of the Committee consists of the following parts:
   1) discussion of the doctoral student's report on the implementation of the IRP;
   2) discussion of the opinion of the supervisor or supervisors on the level of advancement of the IRP implementation;
   3) the doctoral student submits a report on the implementation of the IRP;
   4) discussion during which the doctoral student is asked questions;
   5) determining the result of the mid-term evaluation in an open vote by a simple majority of votes.
5. Parts 1, 2 and 5 are conducted without the participation of the doctoral student.
6. A doctoral student's presentation of the report shall not be longer than 15 minutes.
7. The opinion referred to in Paragraph 4, Point 2 should include an assessment of the level of advancement of the IRP implementation of the doctoral student course to mid-term evaluation, an assessment of the quality of cooperation with the doctoral student and forecasts as to the completion date of the dissertation.
8. Minutes of the Committee's work are drawn up, constituting Appendix No. 7 to the Regulations.
9. After the results are announced, the document referred to in Paragraph 8 is forwarded to the doctoral student and the supervisor.

## CONDITIONS FOR EXTENDING THE CLOSING DATE FOR SUBMITTING A DOCTORAL DISSERTATION

**§ 18**

**Criteria for Extending the Closing Date for Submitting a Dissertation**

1) At the request of the doctoral student, the Head may extend the closing date for submitting the doctoral dissertation set in the IRP, but no longer than by two years, in the case of:
   1) occurrence of unpredictable random events;
   2) temporary inability to pursue education due to illness;
   3) having a certificate confirming the degree of disability;
   4) the need to provide personal care for a sick family member;
   5) the need to provide personal care for a child up to four years of age or a child with a certified disability;

6) problems in implementing the individual research plan that are not due to the doctoral student'sfault.

**§ 19**

**Application for an Extension of the Dissertation Submission Closing date**

1) An application for an extension of the closing date for submitting a doctoral dissertation includes:
   1) doctoral student's data: name, surname, PESEL number, and in the absence thereof, the number of the document confirming identity and indication of the semester in which the education takes place;
   2) justification along with the expected date of submission of the doctoral dissertation;
   3) opinion of the supervisor, supervisors and assistant supervisor.

## RIGHTS AND OBLIGATIONS OF DOCTORAL STUDENTS AND CANDIDATES

**§ 20**

**Doctoral Student Rights**

A doctoral student has the right to:

1) scientific supervision of the supervisor or supervisors, or supervisor and assistant supervisor in the preparation of the doctoral dissertation;
2) replacement of the supervisor or supervisors;
3) use of laboratories, scientific and research equipment and apparatus, as well as library collections and IT resources to the extent necessary to implement the educational program, the IRP, and prepare a doctoral dissertation following the principles set out in separate regulations;
4) apply for an extension of the closing date for submitting the doctoral dissertation, but no longer than two years;
5) receiving a doctoral scholarship, the total period of which may not exceed four years, provided that the conditions specified by law are met. The amount of the monthly doctoral scholarship is at least:
   a) 37% of the professor's salary until the month in which the mid-term evaluation was carried out;
   b) 57% of the professor's salary after the month in which the mid-term evaluation was carried out;
6) undergoing research internships or study trips;
7) applying for accommodation in the University's student dormitory or meals in the University's student canteen, on the terms set out in separate regulations;
8) applying for accommodation of a spouse or child in a university student dormitory on the terms specified in separate regulations;
9) rest leaves not exceeding eight weeks a year;
10) suspension of education for the reasons specified in § 12, Paragraphs 1 and 2;
11) joining organizations or associations of doctoral students and candidates at Bydgoszcz University of Science and Technology;
12) having a doctoral student ID.

## § 21

## Doctoral Student Obligations

The responsibilities of the doctoral student include:

1) compliance with the provisions of these Regulations;
2) timely implementation of the education programme and the IRP;
3) participation in classes resulting from the education program;
4) submitting an application for the appointment of a supervisor or supervisors and a statement on the discipline in which the doctoral dissertation is being carried out within thirty days from the commencement of education;
5) submitting the IRP by September 30 of the second semester of education, along with a report on its implementation;
6) submitting a report on the implementation of the IRP by September 30 of the 4th, 6th and 8th semester of education;
7) acting following the oath taken;
8) submitting, at the request of the Head of the Scientific Council of the Discipline, a declaration for the purposes of evaluating the quality of scientific activity, authorizing the University to demonstrate scientific achievements in the discipline in which the doctoral dissertation is being prepared;
9) possession of an electronic researcher ID compliant with international ORCID standards. the doctoral student must submit a declaration of their ID within thirty days of starting their studies;
10) a report on scientific achievements resulting from training at the Doctoral School for the purposes of evaluating the quality of scientific activity;
11) providing the Head of the Doctoral School with the information required by law in order to enter it into the Integrated Information System on Higher Education and Science "POL-on";
12) compliance with fire safety and occupational health and safety rules and regulations;
13) immediately notifying the Head of the Doctoral School about the change of name and address, as well as about changes to other data required by the University;
14) use the e-mail address in the pbs.edu.pl domain, assigned for contact with members of academic staff and the university administration;
15) settlement with the University following the electronic circulation card issued in the USOSweb system.

## § 22

## Disciplinary Liability of Doctoral Students and Candidates

The disciplinary liability of doctoral students and candidates is regulated in separate regulations.

# MODE OF RECORDING THE COURSE OF EDUCATION

## § 23

1. The Doctoral School maintains documentation of the course of education.
2. The course of a doctoral student's education at the Doctoral School is documented in:
   1) IT service systems;

2) personal data files.

3. The doctoral student's personal file contains in particular:
   1) the candidate's application for admission to the Doctoral School,
   2) in the case of foreigners, the decision on admission to the Doctoral School,
   3) an oath signed by the doctoral student,
   4) a copy of the resolution or notification of the Scientific Council of the Discipline on the appointment, change or dismissal of the supervisor, supervisors or assistant supervisor,
   5) the IRP, including all alterations introduced to it,
   6) reports on the implementation of the IRP,
   7) decisions regarding ITK,
   8) a roll of course credits obtained by the doctoral student at a given stage of education (periodical achievement cards),
   9) a report with the result of the doctoral student's mid-term evaluation,
   10) information about completed professional internships, if the education programme provides for them,
   11) decisions regarding the suspension of education,
   12) individual decisions on punishment,
   13) in the event of removal, the decision to remove from the roll of doctoral students and candidates,
   14) certificate of completion of education at the Doctoral School.

## CONCLUSIONS AND DECISIONS

### § 24

### Closing dates for Submitting and Reviewing Applications

1. A written application by a doctoral student in the matters referred to in § 18, should be submitted to the Head no later than three months before the closing date for submitting the doctoral dissertation specified in the IRP.
2. Applications referred to in **§ 12**, Paragraphs 1, 2 and 6, the doctoral student shall submit to the Head of the Doctoral School no less than fourteen days before the planned date of suspension of education or a rest leave.
3. Applications referred to in **§ 12**, Paragraphs 1, 2 and 6 and § 18, the Head shall consider immediately, no later than thirty days from their submission date.

### § 25

### Decisions

1. Under § 3, Paragraph 3, the Rector makes an administrative decision to admit foreigners to the Doctoral School and remove them from the doctoral students and candidates list.
2. The Head:
   1) enters the roll of doctoral students and candidates;
   2) issues administrative decisions:
      a) refusal to be admitted to the Doctoral School;
      b) to be removed from the roll of doctoral students and candidates, course to § 3, Paragraph 3.

3. Under Article 200, Paragraph 5 and Article 203, Paragraph 3 of PSWiN from the decisions referred to in Paragraph 1 and Paragraph 2, Points 2 is entitled to request that the case be reconsidered.
4. The application referred to in Paragraph 3 shall be submitted to the Head within 14 days from the decision's delivery date.
5. In matters not regulated by these Regulations, decisions are made by the Rector; however, these decisions do not have the nature of administrative decisions unless they result directly from PSWiN.

## FINAL PROVISIONS

### § 26

1. The provisions of the Regulations of the Doctoral School adopted by Resolution N$^{o.}$ 2/453 of the Senate of Jan and Jędrzej Śniadecki University of Technology and Life Sciences dated January 20, 2021, shall apply to matters initiated but not completed before the date of entry into force of these Regulations.
2. These regulations take effect force on October 1, 2023.

Appendix 1
to the Regulations of the Doctoral School at the Bydgoszcz University of Science and Technology

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# Individual Research Plan

For Doctoral Candidate of the Doctoral School

Bydgoszcz University of Science and Technology

*Full name of the doctoral candidate*

Provide your full name
Doctoral candidate's student number

Enter your album number.
*Date*

Click or tap to enter the date.

Submission of the IRP and a report on its implementation. Submission of a report on the implementation of the IRP

Year 1 Year 2 Year 3 Year 4

| Submission of IRP and report on its implementation | Submission of a report on the implementation of the IRP | | |
|---|---|---|---|
| Year One | Year Two | Year Three | Year Four |
| X | | | |

Submission of the IRP revision

| Year Three | Year Four |
|---|---|
| | |

## 1. Characteristics of the Doctoral Dissertation

*The field and discipline in which the dissertation is being prepared.*

Specify the field and scientific discipline.

*Supervisor or supervisors, or a supervisor and an assistant supervisor*

Enter the supervisors' names' details.

*The proposed title of the dissertation*

Enter the proposed title of the dissertation.

*Research objectives or research hypothesis*

List research goals or specify a hypothesis.

*The expected results and contribution to the development of the discipline.*

Describe the expected research results.

.

## 2. Schedule of the Individual Research Plan

| Year of education / Task number | Reference and description of the learning outcome | Implementation date | Description of the task | Evaluation of the progress of the task |
|---|---|---|---|---|
| 1 / 1 | | | | |
| | | | | |
| | | | | |
| | | | | |
| 4 / | | e.g. May 2023 | Submitting the doctoral dissertation | |

## 3. Instructions for drawing up the Individual Research Plan schedule

3.1. The Individual Research Plan with a report in the first year, reports on the implementation of the IRP in the second, third and fourth year, and a possible change of the IRP in the third and fourth years are separate documents.

3.2. Changes to the IRP are introduced using the underlined font to mark new text fragments and ~~strikethrough~~ for deleted fragments.

3.3. The schedule must include tasks resulting from the following:

a) implementation of the research programme;

b) preparation of a doctoral dissertation.

For each item of the schedule, the following should be provided: year of education, task number, reference to learning outcomes at PQF level 8, name of the research task or organizational undertaking, its purpose, method of implementation, methods and tools used, planned effects and source of funding.

3.4. The schedule must contain at least one task from the following list of mandatory tasks:

a. The date of publishing at least one scientific article in a scientific journal or in peer-reviewed materials from an international conference, which in the year of publication of the article in its final form was included in the list drawn up per the provisions issued under Article 267, Section 2, Point 2, Letter b of the Act of 20 July 2018, Law on Higher Education and Science (Journal of Laws 2018, item 1668) or one scientific academic monograph released by a publishing house which, in the year of publication of the monograph in its final form, was included in the list prepared following regulations issued based on Article 267, Section 2, Point 2, Letter a of the Act of 20 July 2018, Law on Higher Education and Science (Journal of Laws 2018, item 1668) or a chapter in such a monograph.
The name of the journal, the number of credits and the date of publication should be provided;

b. Active participation in a scientific conference.
The name of the conference, the date of the conference, the form of presentation (poster, oral presentation), and funding sources should be provided.

c. Submission of a grant application to an agency financing scientific activity through a competition.
Provide the name of the research funding agency, the name of the call, the title of the project and the date of submission of the proposal. Please try to plan the submission of grant applications by the deadline for the mid-term evaluation. Such a deadline guarantees the possibility of conducting research during the doctoral school's education period.

d. Data on at least a research internship or study trip at another university or scientific institution

Please provide the name of the university or scientific institution, date of stay, scientific goals of the trip, sources of funding

e. Submitting a doctoral dissertation
Provide the date of submission of the doctoral dissertation

3.5. In addition to stating the performance or non-performance of the task, the report should briefly summarize the implementation of the task, refer to the results obtained, and present general conclusions. In the case of submitting a grant application, it is worth informing about the results of the competition procedure, if possible.

3.6. The IRP performance report should contain attachments documenting the performance of individual tasks, in particular:

a. Publication: confirmation of the publication of the article containing at least the DOI number;
b. conference speeches - conference agenda from the organizer's materials;
c. grant applications - confirmation from the granting institution;
d. leave for a scientific internship or study visit - trip report confirmed by the host party.

| | |
|---|---|
| Doctoral Candidate's signature | Supervisor's or supervisors' signatures or supervisor's and associate supervisor's signatures |

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# PROFILE OF A DOCTORAL SCHOOL TUTOR

Full name: …

Academic title/field, academic degree/field and discipline, professional title, year of obtaining the title/academic degree/professional title: …

List of classes conducted with doctoral students at the PBS Doctoral School:
…

The following lists concern the last five years, with particular emphasis on the achievements related to classes conducted at the PBS Doctoral School.

List of performed functions of doctoral dissertation's supervisor:
…

List of reviews in the procedure for scientific promotion:
…

List of scientific publications:
…

List of patents and protective works:
…

List of active participation in conferences:
…

List of scholarships and research internships:
…

List of participation in scientific grants:
…

Other significant scientific and professional achievements:
…

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

…… Bydgoszcz, on ……
(Doctoral School stamp)

Reference number: …… / …….

# CERTIFICATE OF COMPLETION OF EDUCATION AT THE DOCTORAL SCHOOL

It is certified that Ms./Mr.
……
born on 2023-02-02 in
……

in the period

**from 2023-02-02 to 2023-02-02**

was a Ph.D. student at the Doctoral School of the Bydgoszcz University of Science and Technology
has completed an individual research plan in a scientific discipline

**discipline name**

has obtained all learning outcomes for qualifications at level 8 of the Polish Qualifications Framework and completed education by submitting a doctoral dissertation entitled:

**dissertation title**

obtaining the arithmetic average of grades in the courses covered by the study plan … .

……..……
(stamp and signature of the Director of the Doctoral School)

Enclosed:
List of learning outcomes achieved for qualifications at the eighth level of the Polish Qualifications Framework regarding completed courses of the educational program.

| **Description of component code and category effect characteristics learning at the eighth level of the Polish Qualifications Framework** | **Names of courses in the education program covering the learning outcome** |
|---|---|
| **P8S_WG**<br>Scope and depth: completeness of the cognitive perspective and relationships | Research Methodology and Planning, Numerical Methods, Grant Kit, Contemporary Trends in the Development of the Discipline, Preparation of Scientific Papers and Presentations, Data Analysis and Presentation, Philosophy of Cognition, A Block of Discipline Elective Courses, Academic Entrepreneurship, Doctoral Seminar |
| **P8S_WK**<br>Context: conditions, effects | Grant Kit, Contemporary Trends in the Development of the Discipline, Philosophy of Cognition, Ethics in Science, Block of General Elective Courses, Block of Discipline Elective Courses, Academic Entrepreneurship |
| **P8S_UW**<br>The use of knowledge: solved problems and performed tasks | Research Methodology and Planning, Numerical Methods, Grant Kit, Contemporary Trends in the Development of the Discipline, Preparation of Scientific Articles and Presentations, Data Analysis and Presentation, Ethics in Science, General Elective Courses, Academic Entrepreneurship |
| **P8S_UK**<br>Communication: receiving and creating statements, disseminating knowledge in the scientific community, and using a foreign language. | Rhetoric, English in Science, Preparation of Scientific Articles and Presentations, A Block of Elective General Courses, Academic Entrepreneurship, Internship, Doctoral Seminar |
| **P8S_UO**<br>Organization of work: planning and teamwork | Grant Kit, A Block of General Elective Courses, Academic Entrepreneurship, Professional Training |
| **P8S_UU**<br>Learning: planning individual development and the development of others | Ethics in Science, A Block of General Elective Courses, Academic Entrepreneurship, Professional Training, Doctoral Seminar |
| **P8S_KK**<br>Evaluation: a critical approach | Methodology and Research Planning, Numerical Methods, Contemporary Trends in the Development of the Discipline, Preparation of Scientific Articles and Presentations, Data Analysis and Presentation, Philosophy of Cognition, Selection of Courses within the Discipline, Doctoral Seminar |
| **P8S_KO**<br>Responsibility: fulfilling social obligations and acting for the public interest | Grant Kit, Ethics in Science, Block of General Elective Courses, Academic Entrepreneurship |
| **P8S_KR**<br>Professional role: independence and development of ethos | Preparation of Scientific Articles and Presentations, Ethics in Science, A Block of General Elective Courses, Doctoral Seminar |

Appendix 4
to the Regulations of the Doctoral School at the Bydgoszcz University of Science and Technology

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

…… Bydgoszcz, on……
Doctoral Candidate's full name

……
Student's number

## THE SCIENTIFIC COUNCIL OF THE DISCIPLINE

## APPLICATION FOR APPOINTMENT OF SUPERVISORS

I declare the completion of a doctoral dissertation in the following discipline:

……

and I am asking for the appointment of the supervisor/supervisors* and the assistant supervisor* of my doctoral dissertation in the person/persons:

1) supervisor ……
(Full name, degree, or academic title)
2) supervisor ……
(Full name, degree, or academic title)
3) assistant supervisor ……
(Full name, degree, or academic title)

*Reasons*:
……
……
……

I enclose to the application the consent of the persons mentioned above to assume the function of supervisors.

……..……

(Legible signature of the doctoral candidate)

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

**Opinion of the Head of the Doctoral School:**

……...……

……

……...……

…… ……

……..……

(signature of the Head of the Doctoral School)

* delete as appropriate

…… Bydgoszcz, on ……

(University stamp)

**Notification of the Appointment as Supervisor/Assistant Supervisor***

Under the resolution of the Scientific Council of the Discipline……/ of the Bydgoszcz University of Science and Technology N°. ……..… dated …… and in connection with Article 190, Section 1 and Article 183 of the Act of July 20, 2018, Law on Higher Education and Science (Journal of Laws of 2022, Item 574, as amended[1]), I inform you that

**Mr. /Ms.** ……

has/has been appointed as the **Supervisor/Assistant Supervisor*** for scientific supervision over the preparation of the doctoral dissertation by

Mr./Ms.* mgr/inż.* ……..……

in the field of science: ……

in the scientific discipline: .....

At the same time, I oblige you to provide scientific care thoroughly and diligently, maintaining the highest standards and norms applicable in this area.

As remuneration for the proper performance of the function of the Supervisor/Assistant Supervisor*, you will receive a single payment in the amount specified following Article 184, Section 2 of the Act of July 20, 2018, Law on Higher Education and Science (Journal of Laws of 2022, item 574, as amended[1]), payable after the completion of the procedure for awarding the doctoral degree, as a result of which it was awarded.

Further, I inform you that following Article 56 of the Code of Administrative Procedure, you are entitled to reimbursement of travel costs related to your appearance in person. The claim for payment should be submitted to the public administration body responsible for the pending proceedings before issuing the decision; otherwise, the claim will be lost.

This document loses its validity in the case of:

1) failure to perform or improper performance of tasks resulting from the entrusted function, which will result in adopting a resolution to change the Supervisor/Auxiliary Supervisor*;
2) resignation from the promotion after indicating important reasons justifying the resignation;
3) adopt a resolution to change the Supervisor/Assisting Supervisor* at the request of a doctoral student, in particularly justified cases;
4) resignation of the doctoral student from education at the Doctoral School or removal from the list of participants of the Doctoral School;
5) the candidate's resignation from applying for a doctoral degree in extramural mode.

……

Signature of the Head of the Scientific Council of the Discipline

**delete as appropriate*

[1] Amendments to the Act were published in the Journal Laws of 2022, Item 583, 655, 682, 807, 1010, 1079 and 1117.

To fulfill the information obligations specified in the provisions on the protection of personal data, the University informs:

1) The administrator of personal data processed in connection with the appointment as a Supervisor/Assistant Supervisor* is the Bydgoszcz University of Technology with its registered office in Bydgoszcz Aleje Prof. Sylwestra Kaliskiego 7, 85-796 Bydgoszcz. Contact with the Data Protection Officer: iod@pbs.edu.pl;
2) Personal data will be processed to perform the function of scientific supervision over the preparation of the doctoral dissertation and the preparation of related documentation, which is necessary for the implementation of public tasks of the University (in connection with Article 6(1)(e) of the Regulation of the European Parliament and of the Council (EU) 2016/679 (GDPR). In addition, the basis for processing may be its necessity for purposes arising from legitimate interests pursued by the administrator performing his duties related to the implementation of the procedure for conferring a doctoral degree;
3) The processing of personal data will be necessary throughout the performance of the function of the Supervisor/Assistant Supervisor*, but also later - during the limitation period for any claims arising from it, as well as for archival purposes for the period set out in the archiving regulations;
4) Following Article 89, Section 1 of the GDPR, your data will be made available only to entities authorized to obtain personal data based on legal provisions, including the provisions on public information, in connection with implementing financial tasks from public funds. The administrator may transfer personal data to entities supporting the administrator in the provision of electronic services, which will provide and maintain IT systems of the University of Technology;
5) The person to whom the personal data relates has the right to access their data and the right to rectify, delete, and limit processing. Such a person also has the right to transfer data and object to the processing that the administrator performs regarding a legally justified interest. The data subject, if it is considered that the processing violates the provisions of the GDPR, has the right to complain to the supervisory body dealing with the protection of personal data; in Poland, it is the President of the Office for Personal Data Protection (PUODO), with its office located at Stawki 2, 00-193 Warsaw;
6) Processing personal data is necessary in connection with the appointment as a Supervisor/Assistant Supervisor*. Failure to provide data would be equivalent to the lack of ability to perform this function and receive remuneration.

Appendix 6
to the Regulations of the Doctoral School at the Bydgoszcz University of Science and Technology

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

…… Bydgoszcz, on…….
Full name of the doctoral candidate

……
Student number

**THE SCIENTIFIC COUNCIL FOR THE DISCIPLINE**
**…**

# REQUEST TO CHANGE SUPERVISORS

I kindly ask you to change the supervisor/supervisors/assistant supervisor* of my doctoral dissertation in the person/persons from:

1. supervisor ……..……..
(full name, academic degree or title)
2. supervisor……..……
(full name, academic degree or title)
3. assistant supervisor ……..…….
(full name, academic degree or title)

for:

1. supervisor ……..……..
(full name, academic degree or title)
2. supervisor……..……
(full name, academic degree or title)
3. assistant supervisor ……..…….
(full name, academic degree or title)

*Grounds*:
…….....
.....

I enclose to the application the consent of the persons mentioned above to assume the function of promoters.

……..…….
(legible signature of the doctoral candidate)

**Opinion of the Head of the Doctoral School:**

……...……

……...……

……

……..……

(signature of the Head of the Doctoral School)

** delete as appropriate*

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# Mid-term evaluation report

## of a doctoral candidate

*Full name of the doctoral candidate*

Provide your first name and surname

*Student number*

Provide your student number

*Issued on*

Click or tap to enter the date

*The Head of the Board*

Provide the first name and surname

*Board Member 1*

Provide the first name and surname

*Board Member 2*

Provide the first name and surname

Al. Prof. S. Kaliskiego 7, 85-796 Bydgoszcz
Phone number: +48 52 374 93 30, fax +48 52 374 93 27
e-mail address: szkola.doktorska@pbs.edu.pl

## 1. Assessment of the Individual Research Plan and the report on the implementation of the Individual Research Plan

*Evaluation of the implementation of the Individual Research Plan*

Head of the Board

…

Board Member 1

…

Board Member 2

…

## 2. Comments on the opinion of the Supervisor/Supervisor

*Comments on the opinion of the Supervisor/Supervisors*

Head of the Board

…

Board Member 1

…

Board Member 2

…

## 3. Evaluation of the doctoral candidate's self-report

*When evaluating the self-report, reference should be made to:*
*– advancement of work progress,*
*– correlation of the self-presentation with IPB and the Supervisor's opinion.*

…

*Conclusions from the discussion with the doctoral candidate*

…

## 4. The result of the mid-term evaluation of the doctoral student

*Percentage of completion of the doctoral dissertation:*

Select an element.

*Does the doctoral student promise to complete the doctoral dissertation during the four years of education at the Doctoral School?*

…

*The result of the mid-term evaluation:*

— Select an element —

Grounds for the assessment result to be published on the Publishing System Public Information (BIP):

## 5. Signatures of the members of the Mid-Term Committee

| | |
|---|---|
| Signature of the Head of the Board<br>prof. dr hab. inż. | |
| Board Member 1<br>prof. dr hab. inż. | |
| Board Member 2<br>prof. dr hab. inż. | |

POLITECHNIKA
BYDGOSKA
im. Jana i Jędrzeja Śniadeckich

# Resolution No. 2/496
## Senate
## Bydgoszcz University of Science and Technology
of 25 September 2024

**amending the resolution on the adoption of the Regulations No. 4 of the Doctoral School of the Bydgoszcz University of Science and Technology**

Pursuant to Article 205(5) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2023, item 742, as amended[1)]

*Senate*
*Bydgoszcz University of Science and Technology*
*resolves as follows:*

**§ 1.** The attachment to the Senate's Resolution No. 14/479 of 22 March 2023 on the adoption of the Regulations No. 4 of the PBS Doctoral School is amended as follows:

1) in § 4, paragraph 5 is added as follows:

„5. The curriculum does not specify the types of classes. As part of the syllabus, the instructor may freely choose the form or forms of classes for the course to be pursued.";

2) w § 1 paragraph 3:

a) point 3 is replaced by the following:

„3) in the 4th and 6th semester of education, submitting a report on the implementation of the IRP (Appendix No. 1) by 30 September;",

b) after point 3, point 4 is added:

„4) in the 8th semester of education or at an earlier end of education, submit a report on the implementation of the IRP (Appendix No. 1) by the date of submission of the doctoral dissertation.";

3) in § 8 section 3 point 3 is replaced by the following:

„3) The Head shall prepare an annual report on the quality of education, including in particular an analysis of surveys of doctoral students, graduates and supervisors, the

[1)] Amendments to the consolidated text of the above-mentioned Act were announced in the Journal of Laws of 2023, items 742, 1088, 1234, 1672, 1872 and 2005, of 2024, items 124, 227 and 1089.

hospitality of classes, the grades obtained by doctoral students, the results of the mid-term evaluation, deletions from the list of doctoral students and the doctorates promoted;";

4) In § 12, after paragraph 2, paragraphs 2a and 2b are added:

„2a. At the request of a doctoral student, the Head may suspend education also in cases other than those specified in sections 1-2 above, due to the occurrence of special circumstances on the part of the doctoral student, which prevent or significantly hinder the implementation of education or the implementation of an individual research plan, for a period not longer than 1 year. Suspension of education takes place after consultation with the supervisor.

2b. During the period of suspension referred to in paragraph 2a, the doctoral student shall not receive a doctoral scholarship.";

5) in § 13:

a) paragraph 1 is replaced by the following:

„1. Education at the Doctoral School ends with the submission of a doctoral dissertation with a positive opinion of the supervisor or supervisors. The opinion should include a substantive assessment of the doctoral dissertation submitted by the doctoral student and should confirm the conformity of the doctoral dissertation with the framework resulting from the IRP.",

b) paragraph 3 is replaced by the following:

„3. Submitting the dissertation means entering it into the Diploma Theses Archive system (APD) and accepting it by the supervisor and providing the opinion referred to in paragraph 1.",

c) in paragraph 4, the following second sentence is added:

„The doctoral student shall submit a report on the conducted examination together with the opinion referred to in paragraph 1.",

d) in paragraph 5, the phrase „and to the APD system the electronic version of the doctoral dissertation submitted by the doctoral student" is deleted;

6) in § 17 section 4:

a) The introduction to the enumeration is replaced by the following:

„4. The mid-term evaluation shall take place before the Commission. During the meeting of the Commission, the following shall take place:",

b) in points 1 and 2, the word „discussion" is changed to „discussion",

c) point 3 is replaced by the following:

„3) presentation by a doctoral student of a self-report on the implementation of the IRP;"

7) in § 18:
   a) point 1 is repealed,
   b) point 6 is replaced by the following:
      „6) problems in the implementation of an individual research plan or education programme not resulting from the fault of the doctoral student.”;
8) in § 19 section 1 point 2 is replaced by the following:
   „2) justification, report on the implementation of the IRP and a remedial schedule along with the expected date of submission of the doctoral dissertation;”;
9) Appendices No. 1 and 5 to the Regulations No. 4 of the Jan and Jędrzej Śniadecki Doctoral School shall have the wording specified in Appendices No. 1 and 2 to this Resolution, respectively.

**§ 2.** The resolution shall enter into force on the date of signing.

President of the Senate
Rector

Prof. Marek ADAMSKI, PhD, DSc, Eng.

Appendix to the Resolution of the PBS Senate Nº. 14/479
of March 22, 2023.

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# REGULATIONS Nº. 4
# OF THE DOCTORAL SCHOOL

# BYDGOSZCZ UNIVERSITY
# OF SCIENCE AND TECHNOLOGY

The consolidated text was developed on the basis of:

1) Resolution of the PBS Senate No. 14/479 of March 22, 2023
2) Amendment No. 1 introduced by the resolution of the PBS Senate No. 2/496 of September 25, 2024

Bydgoszcz 2024

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## GENERAL PROVISIONS

### § 1

1. Regulations of the Doctoral School of Bydgoszcz University of Science and Technology, hereinafter referred to as the "Doctoral School," define the organization of education and the rights and obligations of doctoral students and candidates related to education at this school.

2. The Doctoral School is run by Bydgoszcz University of Science and Technology, hereinafter referred to as "the University."

3. The Doctoral School may provide education in scientific disciplines in which the University is authorized to award doctoral degrees.

## LEGAL BASIS AND DEFINITIONS

### § 2

1. The Doctoral School of Bydgoszcz University of Science and Technology is conducted based on applicable regulations, in particular:
   1) The Act of July 3, 2018: Provisions introducing the Act: Law on Higher Education and Science;
   2) the Act of July 20, 2018: Law on Higher Education and Science, hereinafter referred to in Polish as PSWiN;
   3) the Statute of Bydgoszcz University of Science and Technology.
2. Whenever the text of Regulations refers to:
   1) the University, it refers to Bydgoszcz University of Science and Technology;
   2) the Rector, it refers to the Rector of the University;
   3) the Statute, it refers to the Statute of the University;
   4) the Doctoral School it refers to the Doctoral School of Bydgoszcz University of Science and Technology;
   5) the Council, it refers to the Council of the Doctoral School of Bydgoszcz University of Science and Technology;
   6) the Committee, it refers to the Committee for the mid-term evaluation of doctoral students and candidates;
   7) the Head, it refers to the Head of the Doctoral School.

## PRINCIPLES OF EDUCATION

### § 3

### General Provisions

1. The education of doctoral students and candidates at the Doctoral School prepares them to obtain a doctoral degree. It is conducted following an educational programme and an Individual Research Plan, hereinafter referred to as "the IRP."
2. Admission to the Doctoral School takes place by way of entry on the roll of doctoral students.
3. Foreigners are admitted to the Doctoral School and removed from the roll of doctoral students and candidates by way of an administrative decision issued by the Rector.

4. Upon taking the oath, a doctoral student begins education and acquires doctoral student rights. Failure to take the oath within two weeks of the commencing of the academic year or the nearest semester after the end of the classification procedure or the date of admission to the Doctoral School specified by the Head is equivalent to not undertaking the education referred to in Article 203, Paragraph 1, Point 4 of PSWiN and results in removal from the roll of doctoral students and candidates.
5. A person can be a doctoral student at only one doctoral school at a time.
6. Education of doctoral students and candidates at the Doctoral School is free of charge.
7. The following may participate in the education of doctoral students and candidates:
   1) academic teachers who are members of research, research and teaching or teaching staff;
   2) specialists from the socio-economic environment.
8. Education at the Doctoral School is conducted in Polish and English.

## § 4

## Education Programme

1. The education programme at the Doctoral School ensures the achievement of learning outcomes for qualifications at the eighth level of the Polish Qualifications Framework (PQF).
2. The education programme is adopted by the Senate, course to the requirement to seek the opinion of the doctoral students and candidates' Council. If the closing date specified in the Statute expires to no avail, the requirement to seek an opinion is deemed to have been met.
3. In the case of courses elective by doctoral students and candidates, education is started by the decision of the Head, who makes the decision based on the number of applicants. The doctoral student submits a declaration regarding the selected courses to the Doctoral School no later than thirty days before the beginning of the semester in which the block of elective courses is planned to be completed.
4. The education programme provides for professional internships in the form of conducting classes or participating in them for up to 60 teaching hours.
5. The curriculum does not specify the types of classes. As part of the syllabus, the instructor may freely choose the form or forms of classes for the course to be pursued.

## § 5

## Academic Year and Its Completion

1. The education of doctoral students and candidates at the Doctoral School lasts four years.
2. The academic year lasts from October 1 to September 30 and is divided into two semesters. The Rector determines the academic year's schedule and organization through an ordinance.
3. The condition for passing a semester of education is:
   1) obtaining all credits and passing all exams provided for in the education programme for a given semester;
   2) in the second semester of education, submitting the IRP and the report on its implementation (Appendix Nº. 1) by September 30;
   3) in the 4th and 6th semester of education, submitting a report on the implementation of the IRP (Appendix Nº. 1) by September 30;
   4) in the 8th semester of education or at an earlier end of education, submit a report on the implementation of the IRP (Appendix No. 1) by the date of submission of the doctoral dissertation.

4. Examinations or credit tests take place on the dates of examination sessions and retake sessions specified by the Rector's regulation referred to in Paragraph 2.
5. The following grading scale is used for course tests and examinations depending on the degree of achievement of learning outcomes:
   1) very good – 5.0;
   2) good plus – 4.5;
   3) good – 4.0;
   4) sufficient– 3.5;
   5) satisfactory – 3.0;
   6) insufficient/fail – 2.0.
6. In the event of an unexcused absence for 1/3 of the course hours in a semester, the instructor is obliged to inform the Head about this fact, who may decide to remove the doctoral student from the roll of doctoral students and candidates.
7. If a doctoral student's unexcused absence from a test or examination within the prescribed period, they receive an entry in the course completion report: "did not take the exam."
8. After receiving an unsatisfactory grade in an examination or a credit test, the doctoral student has the right to retake one exam or credit course.
9. The doctoral student has no right to repeat the semester or resume education after being removed from the roll of doctoral students and candidates for the reasons specified in § 11, Paragraphs 1 and 2.
10. Failure to obtain a credit or fail an examination in one or more courses in a given semester may constitute grounds for removal from the doctoral students and candidates list.
11. In the event of failure to obtain credits or fail an examination in one course, the Head, at the request of the doctoral student, may consent to conditional continuation of education in the following semester. A doctoral student is obliged to obtain credit from this course no later than by the end of the semester in which they conditionally continue education.
12. Sign language interpreters and assistants for people with special needs may participate in assessments and examinations. Persons helping doctoral students and candidates with special needs should have the consent of the Head to participate in examinations and tests.
13. Doctoral students and candidates with special needs, no later than seven days before the start of the examination and retake session, may apply to the course coordinator for:
   1) adjusting the dates of examinations or credit tests to their needs;
   2) changing the form of a credit test or an examination from written to oral or vice versa;
14. during the academic year, the Rector may establish days or hours free from teaching for doctoral students and candidates of the Doctoral School.
15. The timetable is made available to doctoral students and candidates in the Doctoral Student Service IT System no later than two days before the beginning of the semester.

## § 6

## Individual Research Plan

1. The doctoral student prepares the IRP in consultation with the supervisor or supervisors.
2. If an assistant supervisor is appointed, the plan is presented after the opinion of this supervisor.
3. The IRP project is a course to be reviewed by the relevant Scientific Council of the Discipline. The written opinion of the Scientific Council of the Discipline is forwarded to the doctoral student and the supervisor.
4. The doctoral student's IRP specifies in particular:

1) proposed title of the doctoral dissertation, research objectives, research program, expected results, schedule for the preparation of the doctoral dissertation, including the closing date for submitting the dissertation;
2) the date of publication of at least one scientific article in a scientific journal or in peer-reviewed materials from an international conference, which in the year of publication of the article in its final form was included in the list prepared following the regulations issued under Article 267, Paragraph 2, Point 2, Letter b of PSWiN or one scientific monograph published by a publishing house which, in the year of publication of the monograph in its final form, was included in the list prepared following the regulations issued under Article 267, Paragraph 2, Point 2 letter a of PSWiN or a chapter in such a monograph;
3) date of active participation in the scientific conference;
4) closing date for submitting a grant application to the agency financing scientific activities through a competition;
5) the date of completing a research internship or study trip at another university or scientific institution, which cannot be shorter than 1 week or longer than 1 semester.

5. After the mid-term evaluation, the doctoral student may apply to the Head once to change the IRP.
6. In particularly justified cases, the Head of the Doctoral School may consent to change the IRP other than that specified in Paragraph 5.
7. The application referred to in Paragraphs 5 and 6 should include a justification, the amended IRP and the consent of the supervisor or supervisors. The application should include their opinion if an assistant supervisor has been appointed.

## § 7

## Individual Course of Study

1. The Doctoral School provides for an Individual Course of Study (ICS), which involves individually determining the education program and the possibility of exempting a doctoral student from participating in certain classes.
2. A doctoral student who is the manager or contractor of a research project obtained through competition and financed from external sources or is planning a one-semester research internship may apply for the ICS.
3. The doctoral student and their supervisor present the ICS project to the Head, who may consent to its implementation.
4. The ICS documentation must include its rationalization, the educational program, and, in particular, the matrix of compliance with the learning outcomes for PQF Level 8.
5. All learning outcomes for PQF Level 8 must be covered in ICS.
6. The doctoral student may apply to obtain ICS immediately, no later than two weeks after the occurrence of the circumstances indicated in Paragraph 2.

## § 8

## Pro-Quality System

1) The Doctoral School operates a pro-quality system, which includes:
   1) motivational system for doctoral students and candidates;
   2) system for improving the quality of classes.
2) As part of the motivational system for doctoral students and candidates:

1) after obtaining the consent of the Rector, the Head may increase the amount of the doctoral scholarship by 20% to up to 20% of the number of doctoral students and candidates of a given year and language group;
2) when calculating the number of doctoral students and candidates who are entitled to an increased scholarship, the result of calculating the number of entitled persons is rounded down;
3) the scholarship is increased for a period of one year;
4) when creating the roll of scholarship holders, the Head is guided by the average grade (up to four decimal places) accomplished in the previous academic year. If selecting a roll of doctoral students and candidates following their grade point average is not possible, the Head takes into consideration the reports on the implementation of the IRP or a ranking roll of the recruitment process;
5) the increase in the scholarship does not apply to doctoral students and candidates in the first year of education and doctoral students and candidates pursuing ICS;
6) doctoral students and candidates who have obtained a negative result of the mid-term evaluation and those subject to administrative proceedings regarding removal from the roll of doctoral students and candidates are not entitled to an increase in the scholarship.

3) As part of the system for improving the quality of classes:
1) class inspections are carried out following the internal regulations of the University;
2) each semester, doctoral students and candidates evaluate teaching activities following the internal regulations of the University;
3) the Head shall prepare an annual report on the quality of education, including in particular an analysis of surveys of doctoral students, graduates and supervisors, the hospitality of classes, the grades obtained by doctoral students, the results of the mid-term evaluation, deletions from the list of doctoral students and the doctorates promoted;
4) the Council reads the report and recommends to the Head regarding the educational programme and staffing for doctoral students and candidates;
5) persons applying to teach at the Doctoral School must receive a positive opinion from the Council based on documented professional endeavours over the previous five years. Professional undertakings are shown in the profile of the tutor of the Doctoral School (Appendix Nº 2).

## § 9

## Education in Cooperation with Other Research Centers

1. A doctoral student may complete part of their educational process at another university or scientific institution.
2. The Head decides on the conditions for crediting the period of education completed at another university or scientific institution, taking into account the transfer and recognition of credited classes and the implementation of IRP following applicable regulations.
3. Doctoral students and candidates from other doctoral schools may participate in education at the Doctoral School.
4. The Head decides on the possibility of participating doctoral students and candidates referred to in Paragraph 3 in classes, considering the recognition of completed classes and the implementation of IRP following applicable regulations.
5. Education jointly with a foreign center may be carried out based on an agreement.

6. At the request of a doctoral student from a non-domestic university or scientific institution pursuing part of their education at the Doctoral School, they are issued a doctoral Student ID.

**§ 10**

**Transfers**

1. A doctoral student at a Doctoral School run by an entity other than the University may be admitted to the Doctoral School only through recruitment.
2. Commencing education at the Doctoral School is possible after resigning from education at another Doctoral School.
3. Based on the obtained learning outcomes, the Head decides on the semester the doctoral student begins their education.

**§ 11**

**Deletions**

1. A doctoral student is removed from the roll of doctoral students and candidates in the event of:
   1) a negative result of the mid-term evaluation;
   2) failure to submit the doctoral dissertation within the closing date specified in the IRP;
   3) waiving one's education;
   4) not taking up education;
   5) violation of the prohibition referred to in Article 200, Paragraph 7 and Article 209, Paragraph 10 of PSWiN;
   6) being punished with a disciplinary penalty of expulsion from the Doctoral School.
2. A doctoral student may be removed from the roll of doctoral students and candidates in the event of:
   1) unsatisfactory progress in the preparation of the doctoral dissertation;
   2) failure to fulfill the obligations arising from the regulations of the PBS Doctoral School, implementation of the educational programme and IRP.
3. Resignation from education takes place at the written request of the doctoral student.
4. The supervisor may apply together with a justification to remove the doctoral student from the roll of doctoral students and candidates due to unsatisfactory progress in preparing the doctoral dissertation.
5. Subject to § 3, Paragraph 3, removal from the roll of doctoral students and candidates takes place by way of an administrative decision of the Head.
6. The appeal procedure is specified in § 25.
7. A doctoral student who has been removed from the roll of doctoral students and candidates shall cease to be paid a doctoral scholarship as of the first day of the month following the month in which the decision to be removed from the roll of doctoral students and candidates became final.
8. Within fourteen days from the date of deletion:
   1) the doctoral student is obliged to settle all liabilities towards the University, which is confirmed by the clearance slip;
   2) the Head shall notify the Chair of the relevant Scientific Council of the Discipline about the deletion.

## § 12

## Suspension of Education, Absences

1. At the request of a doctoral student, the Head suspends education for a period corresponding to the duration of maternity leave, leave under the terms of maternity leave, and paternity leave specified in the Act of June 26, 1974: Labor Code.
2. The Head, at the request of the doctoral student, may suspend education due to long-term illness for a period not longer than one year.

2a. At the request of a doctoral student, the Head may suspend education also in cases other than those specified in sections 1-2 above, due to the occurrence of special circumstances on the part of the doctoral student, which prevent or significantly hinder the implementation of education or the implementation of an individual research plan, for a period not longer than 1 year. Suspension of education takes place after consultation with the supervisor.

2b. During the period of suspension referred to in paragraph 2a, the doctoral student shall not receive a doctoral scholarship.

3. The suspension period of education for the reason referred to in Paragraph 2 is included in the four years of receiving the scholarship referred to in § 20, Paragraph 5.
4. During the suspension of the education period at the Doctoral School, the closing dates specified in the IRP do not run.
5. The doctoral student is obliged to submit a declaration of commencement of suspended education within two weeks from the end of the period of suspension of education. Failure to submit the declaration within this period is considered a failure to undertake the education referred to in Article 203, Paragraph 1, Point 4 of PSWiN and results in removal from the roll of doctoral students and candidates of the Doctoral School.
6. The Head, at the request of the doctoral student, may consent to the use of rest leaves not exceeding eight weeks a year. Rest leaves are taken during periods free from teaching classes. Each break cannot be shorter than seven days unless the doctoral student's request states otherwise.
7. The dates of rest leaves must be agreed with the supervisor or supervisors in a way that enables the fulfillment of obligations, considering the regulations referred to in § 5, Paragraph 2.
8. Failure of the doctoral student to justify the absence referred to in § 5, Paragraphs 6 and 7 constitute the basis for deletion from the roll of doctoral students and candidates. The absence of a doctoral student due to illness must be documented with a sick leave.
9. The doctoral student is obliged to immediately inform the Doctoral School about absences caused by a research internship, study trip or participation in a conference.
10. If the doctoral student's justified absence occurs during teaching classes, an examination session or a retake session, the doctoral student must make up the arrears in agreement with the course instructor and within the closing dates specified in the order referred to in § 5, Paragraph 2.

## § 13

## Completion of Education

1. Education at the Doctoral School ends with submitting a doctoral dissertation with a positive opinion of the supervisor or supervisors. The opinion should include a substantive assessment of the doctoral dissertation submitted by the doctoral student and should confirm the conformity of the doctoral dissertation with the framework resulting from the IRP..

2. The condition for submitting a doctoral dissertation is to meet the requirements specified in Article 186, Paragraph 1, Points 1, 2, 3 and 5 of PSWiN and the implementation of all IRP tasks.
3. Submitting the dissertation means entering it into the Diploma Theses Archive system (APD) and accepting it by the supervisor and providing the opinion referred to in paragraph 1..
4. In the case of written works, the supervisor's approval takes place after analyzing the result of the dissertation examination using the Uniform Anti-plagiarism System (JSA). The doctoral student shall submit a report on the conducted examination together with the opinion referred to in paragraph 1.
5. The Doctoral School enters the data of the doctoral dissertation into the USOS system.
6. Completion of education is confirmed by a certificate (Appendix No. 3).
7. The certificate of completion of education includes a statement on obtaining or not achieving learning outcomes for qualifications at PQF level 8, information on the average grade for the entire course of education, courses completed by the doctoral student along with the grades obtained and a reference to the learning outcomes at PQF level 8.

**§ 14**

**Termination of Education**

1. If the education of doctoral students and candidates in a given discipline is discontinued, the University provides doctoral students and candidates preparing a doctoral dissertation in this discipline with the opportunity to continue their education at another doctoral school in this discipline.
2. If a doctoral student is unable to undertake education at another doctoral school in a given discipline, the University shall bear the costs of proceedings for awarding a doctoral degree on an extramural basis for doctoral students and candidates who have lost the opportunity to complete their education.

## MODE OF DESIGNATING AND CHANGING the SUPERVISOR, SUPERVISORS OR a SUPERVISOR AND ASSISTANT SUPERVISOR

**§ 15**

1. Within thirty days from the date of commencement of training, the doctoral student shall apply to the Scientific Council of the Discipline (Appendix No. 4) to appoint a supervisor or supervisors or a supervisor and an assistant supervisor.
2. Within three months from the commencement of education, the relevant scientific Council of the discipline appoints a supervisor or supervisors, or a supervisor and an assistant supervisor, for the doctoral student. The Council prepares a notification of the appointment of a supervisor/assistant supervisor (Appendix No. 5) and forwards it to the School and the Science and Evaluation Department.
3. A doctoral student may submit a request to the Scientific Council of the Discipline to change the supervisor or supervisors or the supervisor and assistant supervisor (Appendix No. 6).
4. A doctoral student may apply to the Scientific Council of the Discipline (Appendix No. 4) to appoint a second or assistant supervisor.
5. A doctoral student may submit a request to the Scientific Council of the Discipline to dismiss the supervisor if two supervisors were previously appointed or a request to dismiss

the assistant supervisor if an assistant supervisor was previously appointed. The application must include justification.

6. If the supervisor is no longer able to perform their responsibilities, in particular, due to their death or long-term illness or resignation from the position of supervisor, the doctoral student is obliged to apply for a change of supervisor immediately. The application and the current supervisor's resignation are forwarded to the appropriate Scientific Council of the Discipline for further processing.
7. A resolution on the matters referred to in Paragraph 3-6 disciplines are taken up by the Scientific Council immediately. The provision of Paragraph 2 in the part regarding the submission of notification by the Council shall apply accordingly.
8. The applications referred to in Paragraphs 1, 3, 4 and 6 must contain the following:
   1) proposal of the person or persons of the supervisor or supervisors, or the supervisor and assistant supervisor;
   2) consent to assume the function of supervisor or supervisors, or supervisor and assistant supervisor;
   3) justification.
9. The Head must approve the applications referred to in Paragraphs 1, 3-6.
10. When appointing a supervisor, the Scientific Council of the Discipline is guided by the following premises:
    1) directions of development of the scientific discipline;
    2) the scientific development needs of the candidate for supervisor;
    3) current scientific achievements of the candidate for supervisor;
    4) the current involvement of the candidate for supervisor in the organizational and teaching activities of the unit.
11. The competent Council shall terminate the status of a supervisor or assistant supervisor if a doctoral student is removed from the roll of doctoral students and candidates. The resolution on dismissal may not be adopted earlier than six months from the date the decision on deletion became final.
12. In the event of the death of a doctoral student or resignation from education, at the written request of a doctoral student at the Doctoral School, the resolution referred to in Paragraph 11 shall be undertaken immediately.
13. In the event of punishing the supervisor or assistant supervisor with a disciplinary penalty referred to in Article 276 of PSWiN or in another particularly justified case, the Scientific Council of the Discipline has the right to replace them.

## MODE OF CONDUCTING MID-TERM EVALUATION

### § 16

### Conditions for Carrying Out the Mid-Term Evaluation

1. The mid-term evaluation is carried out after the fourth semester of the education period, no later than October 31.
2. In particularly justified cases, the mid-term evaluation may be carried out using remote communication methods and techniques.
3. By September 30 of the academic year preceding the academic year in which the mid-term evaluation will take place, the doctoral student course to mid-term evaluation is obliged to submit a report on the implementation of the IRP and the opinion of the supervisor or supervisors or the supervisor and assistant supervisor (Appendix N$^{o.}$ 1).

4. The doctoral student's implementation of the IRP is subject to mid-term evaluation.
5. The mid-term evaluation ends with a positive or negative result.
6. The evaluation result and justification are public.
7. The University immediately provides information on the mid-term evaluation results and its justification in its website's Public Information Bulletin.
8. The doctoral student may appeal against the mid-term evaluation results to the Head of the Doctoral School.
9. The closing date for submitting an appeal together with justification is 14 (fourteen) days from the date of making the assessment results available.
10. The Head considers the appeals referred to in Point 7 no longer than within 30 (thirty) days from their submission date. The Head's decision is final.

**§ 17**

**The Mid-Study Evaluation Committee and Its Course**

1. The mid-term evaluation is carried out by a committee composed of three persons, including at least one person holding a habilitation degree or the title of professor in the discipline in which the doctoral dissertation is being prepared, employed outside the entity running the Doctoral School or a person referred to in Article 190, Paragraph 5.
2. The Committee is apppointed by the Head from among the candidates indicated by the Scientific Councils of the disciplines after obtaining an opinion from the Council.
3. The supervisor and assistant supervisor cannot be members of the Committee.
4. The mid-term evaluation shall take place before the Commission. During the meeting of the Commission, the following shall take place:
   1) discussion of the doctoral student's report on the implementation of the IRP;
   2) discussion of the opinion of the supervisor or supervisors on the level of advancement of the IRP implementation;
   3) presentation by a doctoral student of a self-report on the implementation of the IRP;
   4) discussion during which the doctoral student is asked questions;
   5) determining the result of the mid-term evaluation in an open vote by a simple majority of votes.
5. Parts 1, 2 and 5 are conducted without the participation of the doctoral student.
6. A doctoral student's presentation of the report shall not be longer than 15 minutes.
7. The opinion referred to in Paragraph 4, Point 2 should include an assessment of the level of advancement of the IRP implementation of the doctoral student course to mid-term evaluation, an assessment of the quality of cooperation with the doctoral student and forecasts as to the completion date of the dissertation.
8. Minutes of the Committee's work are drawn up, constituting Appendix N$^{o.}$ 7 to the Regulations.
9. After the results are announced, the document referred to in Paragraph 8 is forwarded to the doctoral student and the supervisor.

## CONDITIONS FOR EXTENDING THE CLOSING DATE FOR SUBMITTING A DOCTORAL DISSERTATION

### § 18

### Criteria for Extending the Closing Date for Submitting a Dissertation

1) At the request of the doctoral student, the Head may extend the closing date for submitting the doctoral dissertation set in the IRP, but no longer than by two years, in the case of:
   1) (repealed);
   2) temporary inability to pursue education due to illness;
   3) having a certificate confirming the degree of disability;
   4) the need to provide personal care for a sick family member;
   5) the need to provide personal care for a child up to four years of age or a child with a certified disability;
   6) problems in the implementation of an individual research plan or education programme not resulting from the fault of the doctoral student..

### § 19

### Application for an Extension of the Dissertation Submission Closing date

1) An application for an extension of the closing date for submitting a doctoral dissertation includes:
   1) doctoral student's data: name, surname, PESEL number, and in the absence thereof, the number of the document confirming identity and indication of the semester in which the education takes place;
   2) justification, report on the implementation of the IRP and a remedial schedule along with the expected date of submission of the doctoral dissertation;
   3) opinion of the supervisor, supervisors and assistant supervisor.

## RIGHTS AND OBLIGATIONS OF DOCTORAL STUDENTS AND CANDIDATES

### § 20

### Doctoral Student Rights

A doctoral student has the right to:

1) scientific supervision of the supervisor or supervisors, or supervisor and assistant supervisor in the preparation of the doctoral dissertation;
2) replacement of the supervisor or supervisors;
3) use of laboratories, scientific and research equipment and apparatus, as well as library collections and IT resources to the extent necessary to implement the educational program, the IRP, and prepare a doctoral dissertation following the principles set out in separate regulations;
4) apply for an extension of the closing date for submitting the doctoral dissertation, but no longer than two years;

5) receiving a doctoral scholarship, the total period of which may not exceed four years, provided that the conditions specified by law are met. The amount of the monthly doctoral scholarship is at least:
    a) 37% of the professor's salary until the month in which the mid-term evaluation was carried out;
    b) 57% of the professor's salary after the month in which the mid-term evaluation was carried out;
6) undergoing research internships or study trips;
7) applying for accommodation in the University's student dormitory or meals in the University's student canteen, on the terms set out in separate regulations;
8) applying for accommodation of a spouse or child in a university student dormitory on the terms specified in separate regulations;
9) rest leaves not exceeding eight weeks a year;
10) suspension of education for the reasons specified in § 12, Paragraphs 1 and 2;
11) joining organizations or associations of doctoral students and candidates at Bydgoszcz University of Science and Technology;
12) having a doctoral student ID.

**§ 21**

**Doctoral Student Obligations**

The responsibilities of the doctoral student include:

1) compliance with the provisions of these Regulations;
2) timely implementation of the education programme and the IRP;
3) participation in classes resulting from the education program;
4) submitting an application for the appointment of a supervisor or supervisors and a statement on the discipline in which the doctoral dissertation is being carried out within thirty days from the commencement of education;
5) submitting the IRP by September 30 of the second semester of education, along with a report on its implementation;
6) submitting a report on the implementation of the IRP by September 30 of the 4th, 6th and 8th semester of education;
7) acting following the oath taken;
8) submitting, at the request of the Head of the Scientific Council of the Discipline, a declaration for the purposes of evaluating the quality of scientific activity, authorizing the University to demonstrate scientific achievements in the discipline in which the doctoral dissertation is being prepared;
9) possession of an electronic researcher ID compliant with international ORCID standards. the doctoral student must submit a declaration of their ID within thirty days of starting their studies;
10) a report on scientific achievements resulting from training at the Doctoral School for the purposes of evaluating the quality of scientific activity;
11) providing the Head of the Doctoral School with the information required by law in order to enter it into the Integrated Information System on Higher Education and Science "POL-on";
12) compliance with fire safety and occupational health and safety rules and regulations;

13) immediately notifying the Head of the Doctoral School about the change of name and address, as well as about changes to other data required by the University;
14) use the e-mail address in the pbs.edu.pl domain, assigned for contact with members of academic staff and the university administration;
15) settlement with the University following the electronic circulation card issued in the USOSweb system.

**§ 22**

**Disciplinary Liability of Doctoral Students and Candidates**

The disciplinary liability of doctoral students and candidates is regulated in separate regulations.

## MODE OF RECORDING THE COURSE OF EDUCATION

**§ 23**

1. The Doctoral School maintains documentation of the course of education.
2. The course of a doctoral student's education at the Doctoral School is documented in:
   1) IT service systems;
   2) personal data files.
3. The doctoral student's personal file contains in particular:
   1) the candidate's application for admission to the Doctoral School,
   2) in the case of foreigners, the decision on admission to the Doctoral School,
   3) an oath signed by the doctoral student,
   4) a copy of the resolution or notification of the Scientific Council of the Discipline on the appointment, change or dismissal of the supervisor, supervisors or assistant supervisor,
   5) the IRP, including all alterations introduced to it,
   6) reports on the implementation of the IRP,
   7) decisions regarding ITK,
   8) a roll of course credits obtained by the doctoral student at a given stage of education (periodical achievement cards),
   9) a report with the result of the doctoral student's mid-term evaluation,
   10) information about completed professional internships, if the education programme provides for them,
   11) decisions regarding the suspension of education,
   12) individual decisions on punishment,
   13) in the event of removal, the decision to remove from the roll of doctoral students and candidates,
   14) certificate of completion of education at the Doctoral School.

## CONCLUSIONS AND DECISIONS

**§ 24**

**Closing dates for Submitting and Reviewing Applications**

1. A written application by a doctoral student in the matters referred to in § 18, should be submitted to the Head no later than three months before the closing date for submitting the doctoral dissertation specified in the IRP.

2. Applications referred to in **§ 12**, Paragraphs 1, 2 and 6, the doctoral student shall submit to the Head of the Doctoral School no less than fourteen days before the planned date of suspension of education or a rest leave.
3. Applications referred to in **§ 12**, Paragraphs 1, 2 and 6 and § 18, the Head shall consider immediately, no later than thirty days from their submission date.

**§ 25**

**Decisions**

1. Under § 3, Paragraph 3, the Rector makes an administrative decision to admit foreigners to the Doctoral School and remove them from the doctoral students and candidates list.
2. The Head:
    1) enters the roll of doctoral students and candidates;
    2) issues administrative decisions:
        a) refusal to be admitted to the Doctoral School;
        b) to be removed from the roll of doctoral students and candidates, course to § 3, Paragraph 3.
3. Under Article 200, Paragraph 5 and Article 203, Paragraph 3 of PSWiN from the decisions referred to in Paragraph 1 and Paragraph 2, Points 2 is entitled to request that the case be reconsidered.
4. The application referred to in Paragraph 3 shall be submitted to the Head within 14 days from the decision's delivery date.
5. In matters not regulated by these Regulations, decisions are made by the Rector; however, these decisions do not have the nature of administrative decisions unless they result directly from PSWiN.

**FINAL PROVISIONS**

**§ 26**

1. The provisions of the Regulations of the Doctoral School adopted by Resolution N$^{o.}$ 2/453 of the Senate of Jan and Jędrzej Śniadecki University of Technology and Life Sciences dated January 20, 2021, shall apply to matters initiated but not completed before the date of entry into force of these Regulations.
2. These regulations take effect force on October 1, 2023.

Appendix 1
to the Regulations of the Doctoral School at the Bydgoszcz University of Science and Technology

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# Individual Research Plan

For Doctoral Candidate of the Doctoral School

Bydgoszcz University of Science and Technology

*Full name of the doctoral candidate*

Provide your full name
Doctoral candidate's student number

Enter your album number.
*Date*

Click or tap to enter the date.

Submission of the IRP and a report on its implementation. Submission of a report on the implementation of the IRP

Year 1 Year 2 Year 3 Year 4

| Submission of IRP and report on its implementation | Submission of a report on the implementation of the IRP | | |
|---|---|---|---|
| Year One | Year Two | Year Three | Year Four |
| X | | | |

Submission of the IRP revision

| Year Three | Year Four |
|---|---|
| | |

## 1. Characteristics of the Doctoral Dissertation

*The field and discipline in which the dissertation is being prepared.*

Specify the field and scientific discipline.

*Supervisor or supervisors, or a supervisor and an assistant supervisor*

Enter the supervisors' names' details.

*The proposed title of the dissertation*

Enter the proposed title of the dissertation.

*Research objectives or research hypothesis*

List research goals or specify a hypothesis.

*The expected results and contribution to the development of the discipline.*

Describe the expected research results.

.

## 2. Schedule of the Individual Research Plan

Table 1. Tasks related to the implementation of an individual research program and preparation of a doctoral dissertation

| Year of education / Task number | Reference and description of the learning outcome | Implementation date | Description of the task | Evaluation of the progress of the task |
|---|---|---|---|---|
| 1 / 1 | | | | |
| | | | | |
| | | | | |
| | | | | |
| 4 / | | e.g. May 31, 2028 | Submitting the doctoral dissertation | |

Table 2. Mandatory tasks

| Year of education | Reference and description of the learning outcome | Implementation date | Description of the task | Evaluation of the progress of the task |
|---|---|---|---|---|
| 1 | | | Publishing at least one scientific article in a scientific journal or in peer-reviewed materials from an international conference, which in the year of publication of the article in its final form was included in the list drawn up per the provisions issued under Article 267, Section 2, Point 2, Letter b of the Act of 20 July 2018, Law on Higher Education and Science (Journal of Laws 2018, item 1668) or one scientific academic monograph released by a publishing house which, in the year of publication of the monograph in its final form, was included in the list prepared following regulations issued based on Article 267, Section 2, Point 2, Letter a of the Act of 20 July 2018, Law on Higher Education and Science (Journal of Laws 2018, item 1668) or a chapter in such a monograph.<br><br>The name of the journal, the number of credits and the date of publication should be provided:<br>… | confirmation of the publication of the article containing at least the DOI number |
| | | | Active participation in a scientific conference. | conference agenda from the organizer's materials |

| Year of education | Reference and description of the learning outcome | Implementation date | Description of the task | Evaluation of the progress of the task |
|---|---|---|---|---|
| | | | The name of the conference, the date of the conference, the form of presentation (poster, oral presentation), and funding sources should be provided:<br>… | |
| 1 or 2 | | | Submission of a grant application to an agency financing scientific activity through a competition.<br><br>Provide the name of the research funding agency, the name of the call, the title of the project and the date of submission of the proposal. Please try to plan the submission of grant applications by the deadline for the mid-term evaluation. | confirmation from the granting institution |
| | | | Research internship or study trip at another university or scientific institution<br><br>Please provide the name of the university or scientific institution, date of stay, scientific goals of the trip, sources of funding | trip report confirmed by the host party |
| 4 | | e.g. May 31, 2028 | Submitting the doctoral dissertation | |

## 3. Instructions for drawing up the Individual Research Plan schedule

3.1. The Individual Research Plan with a report in the first year, reports on the implementation of the IRP in the second, third and fourth year, and a possible change of the IRP in the third and fourth years are separate documents.

3.2. Changes to the IRP are introduced using the underlined font to mark new text fragments and ~~strikethrough~~ for deleted fragments.

3.3. The schedule must include tasks resulting from the following:

a) implementation of the research programme;

b) preparation of a doctoral dissertation.

For each item of the schedule, the following should be provided: year of education, task number, reference to learning outcomes at PQF level 8, name of the research task or organizational undertaking, its purpose, method of implementation, methods and tools used, planned effects and source of funding.

3.4. The schedule must contain at least one task from the following list of mandatory tasks:

a. The date of publishing at least one scientific article in a scientific journal or in peer-reviewed materials from an international conference, which in the year of publication of the article in its final form was included in the list drawn up per the provisions issued under Article 267, Section 2, Point 2, Letter b of the Act of 20 July 2018, Law on Higher Education and Science (Journal of Laws 2018, item 1668) or one scientific academic monograph released by a publishing house which, in the year of publication of the monograph in its final form, was included in the list prepared following regulations issued based on Article 267, Section 2, Point 2, Letter a of the Act of 20 July 2018, Law on Higher Education and Science (Journal of Laws 2018, item 1668) or a chapter in such a monograph.

The name of the journal, the number of credits and the date of publication should be provided;

b. Active participation in a scientific conference.

The name of the conference, the date of the conference, the form of presentation (poster, oral presentation), and funding sources should be provided.

c. Submission of a grant application to an agency financing scientific activity through a competition.

Provide the name of the research funding agency, the name of the call, the title of the project and the date of submission of the proposal. Please try to plan the submission of grant applications by the deadline for the mid-term evaluation. Such a deadline guarantees the possibility of conducting research during the doctoral school's education period.

d. Data on at least a research internship or study trip at another university or scientific institution

Please provide the name of the university or scientific institution, date of stay, scientific goals of the trip, sources of funding

e. Submitting a doctoral dissertation
Provide the date of submission of the doctoral dissertation

3.5. The report should state whether the task has been completed or is in progress, and if so, the percentage of its completion should be specified. In addition, the task completion should be briefly summarized, the results obtained should be referred to, and general conclusions should be presented. In the case of submitting a grant application, it is worth informing about the results of the competition procedure, if possible.

3.6. The IRP performance report should contain attachments documenting the performance of individual tasks, in particular:

a. Publication: confirmation of the publication of the article containing at least the DOI number;
b. conference speeches - conference agenda from the organizer's materials;
c. grant applications - confirmation from the granting institution;
d. leave for a scientific internship or study visit - trip report confirmed by the host party.

| | |
|---|---|
| Doctoral Candidate's signature | Supervisor's or supervisors' signatures or supervisor's and associate supervisor's signatures |

…… Bydgoszcz, on ……

(University stamp)

**Notification of the Appointment as Supervisor/Assistant Supervisor***

Under the resolution of the Scientific Council of the Discipline……/ of the Bydgoszcz University of Science and Technology N^o. ……..… dated …… and in connection with Article 190, Section 1 and Article 183 of the Act of July 20, 2018, Law on Higher Education and Science, I inform you that

**Mr. /Ms.** ……

has/has been appointed as the **Supervisor/Assistant Supervisor*** for scientific supervision over the preparation of the doctoral dissertation by

Mr./Ms.* mgr/inż.* ……..……

in the field of science: ……

in the scientific discipline: .....

At the same time, I oblige you to provide scientific care thoroughly and diligently, maintaining the highest standards and norms applicable in this area.

As remuneration for the proper performance of the function of the Supervisor/Assistant Supervisor*, you will receive a single payment in the amount specified following Article 184, Section 2 of the Act of July 20, 2018, Law on Higher Education and Science, payable after the completion of the procedure for awarding the doctoral degree, as a result of which it was awarded.

I declare that I will provide the doctoral student with proper conditions for the implementation of the education program and individual research plans, as well as for the preparation of doctoral dissertations, including ensuring access to the necessary infrastructure.

Further, I inform you that following Article 56 of the Code of Administrative Procedure, you are entitled to reimbursement of travel costs related to your appearance in person. The claim for payment should be submitted to the public administration body responsible for the pending proceedings before issuing the decision; otherwise, the claim will be lost.

This document loses its validity in the case of:

1) failure to perform or improper performance of tasks resulting from the entrusted function, which will result in adopting a resolution to change the Supervisor/Auxiliary Supervisor*;
2) resignation from the promotion after indicating important reasons justifying the resignation;
3) adopt a resolution to change the Supervisor/Assisting Supervisor* at the request of a doctoral student, in particularly justified cases;
4) resignation of the doctoral student from education at the Doctoral School or removal from the list of participants of the Doctoral School;
5) the candidate's resignation from applying for a doctoral degree in extramural mode.

……

Signature of the Head of the Scientific Council of the Discipline

**delete as appropriate*

To fulfill the information obligations specified in the provisions on the protection of personal data, the University informs:

1) The administrator of personal data processed in connection with the appointment as a Supervisor/Assistant Supervisor* is the Bydgoszcz University of Technology with its registered office in Bydgoszcz Aleje Prof. Sylwestra Kaliskiego 7, 85-796 Bydgoszcz. Contact with the Data Protection Officer: iod@pbs.edu.pl;
2) Personal data will be processed to perform the function of scientific supervision over the preparation of the doctoral dissertation and the preparation of related documentation, which is necessary for the implementation of public tasks of the University (in connection with Article 6(1)(e) of the Regulation of the European Parliament and of the Council (EU) 2016/679 (GDPR). In addition, the basis for processing may be its necessity for purposes arising from legitimate interests pursued by the administrator performing his duties related to the implementation of the procedure for conferring a doctoral degree;
3) The processing of personal data will be necessary throughout the performance of the function of the Supervisor/Assistant Supervisor*, but also later - during the limitation period for any claims arising from it, as well as for archival purposes for the period set out in the archiving regulations;
4) Following Article 89, Section 1 of the GDPR, your data will be made available only to entities authorized to obtain personal data based on legal provisions, including the provisions on public information, in connection with implementing financial tasks from public funds. The administrator may transfer personal data to entities supporting the administrator in the provision of electronic services, which will provide and maintain IT systems of the University of Technology;
5) The person to whom the personal data relates has the right to access their data and the right to rectify, delete, and limit processing. Such a person also has the right to transfer data and object to the processing that the administrator performs regarding a legally justified interest. The data subject, if it is considered that the processing violates the provisions of the GDPR, has the right to complain to the supervisory body dealing with the protection of personal data; in Poland, it is the President of the Office for Personal Data Protection (PUODO), with its office located at Stawki 2, 00-193 Warsaw;
6) Processing personal data is necessary in connection with the appointment as a Supervisor/Assistant Supervisor*. Failure to provide data would be equivalent to the lack of ability to perform this function and receive remuneration.

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# CRITERION 4

## Quality of the recruitment process

# Rules of admission to the Doctoral school

# Resolution No. 9/428 of the Senate of the Jan and Jędrzej Śniadecki University of Technology and Life Sciences in Bydgoszcz of 22 May 2019

on determining the conditions and procedure of recruitment to the Doctoral School of the Jan and Jędrzej Śniadecki University of Technology and Life Sciences in Bydgoszcz

Pursuant to Article 291 of the Act of 3 July 2018, the provisions introducing the Law on Higher Education and Science (Journal of Laws of 2018, item 1669, as amended)

The Senate of the Jan and Jędrzej Śniadecki University of Technology and Life Sciences in Bydgoszcz is hereby announced:

§1

The conditions and procedure of recruitment to the Doctoral School of the Jan and Jędrzej Śniadecki University of Technology and Life Sciences in Bydgoszcz are hereby defined, constituting an annex to the resolution.

§2

The resolution enters into force on the day of its adoption.

Through the chairman of the Senate
Rektor
prof. dr hab. inż. Tomasz TOPOLIŃSKI

# Rules for admitting candidates for the first year of education to the Doctoral School in the academic year 2019/2020

## I. SCIENTIFIC DISCIPLINES

In the academic year 2019/2020, the J.J. Śniadecki University of Technology and Life Sciences in Bydgoszcz is recruiting candidates for the doctoral school in the following scientific disciplines:

- information and communication technology,
- mechanical engineering,
- chemical sciences,
- agriculture and horticulture,
- animal science and fisheries.

The Rector, at the request of the Director, makes a decision on the launch of the recruitment and the number of limited places in the Doctoral School. The Director, in consultation with the Scientific Councils of the Disciplines, determines the number of limit places for each discipline, taking into account the staff of professors and habilitated doctors, as well as the personnel policy.

## II. RULES OF CLASSIFICATION PROCEDURE

I . The basis for applying for admission to the first year of the doctoral school is:

- possession of the professional title of Master of Engineering or equivalent, or in the case of a person referred to in Article 186(2) of the Law on Higher Education and Science (Journal of Laws of 2018, item 1668, as amended), possession of the professional title of engineer, − submission of a set of documents within the set deadlines,
- meeting the requirements of the classification procedure.

2. Admission of candidates for the first year of the doctoral school takes place within the admission limits.
3. Admission of candidates to the doctoral school takes place by means of a competition based on the results of the classification procedure and has the character of a ranking of the sum of points obtained by the candidate.

## III. REQUIRED **DOCUMENTS AND DEADLINES FOR THEIR SUBMISSION**

### 1. LIST OF DOCUMENTS

A candidate applying for admission to the first year of education at a doctoral school is obliged to submit a set of documents containing:

- providing on the established UTP form (Appendix No. 1.1) containing names and surnames, date and place of birth, PESEL number, address of residence, correspondence address, name of the field of study completed, profile of studies, discipline to which the field of study is assigned, and in the case of a field of study assigned to more than one discipline – the leading discipline, the result of graduation, the form of study, the professional title and the date of its acquisition, indication of the scientific discipline represented in the doctoral school in which the candidate intends to obtain a doctoral degree, telephone number, e-mail address;

- original/copy of the diploma with a supplement confirming the acquisition of a second-cycle qualification, long-cycle master's degree or in the case of a person referred to in Article 186. Section 2, original/copy of the diploma with a supplement confirming the achievement of the first degree qualification;

- 1 photo compliant with the requirements applicable to the issuance of identity cards and a photo in electronic form with a size of at least 300x375 pixels of appropriate quality (JPG format), maximum file size with a photo of 1 MB; the photo delivered electronically should be identical to the photo "on paper" delivered to the university together with other documents;

- additional documents constituting the basis for assessment during the recruitment process, i.e.: language certificate, draft of research plans, opinion of the current research supervisor (e.g. thesis supervisor, research club supervisor, etc.) (Appendix no. 1.2), preliminary declaration of the future supervisor of the doctoral dissertation, copies of scientific articles, certificates of participation in scientific conferences, documents confirming the possession of other documented qualifications and professional qualifications, project implementation agreement under the "Diamond Grant" program;

- Disabled candidates additionally submit a disability certificate issued by the Voivodeship Disability Assessment Team.

**2. SUBMISSION OF DOCUMENTS**

Submission of documents to the Doctoral School takes place from 1 to 20 September 2019. The Rector, at the request of the Doctoral School Admissions Committee, may extend the deadline for submitting documents, but no longer than until the day preceding the grading date.

**3. ANNOUNCEMENT OF RESULTS**

1. The results of the recruitment procedure are public.
2. The results of the classification procedure are announced by posting the names of persons admitted and not admitted to the first year of education on the notice board of the doctoral school.
3. Admission to the doctoral school takes place by entering the list of doctoral students.
4. Refusal of admission to the doctoral school is made by way of an administrative decision, by registered letter with confirmation of receipt to the address indicated in the submitted documents.
5. The decision may be subject to a request for reconsideration of the case.

## IV. RECRUITMENT COMMITTEE

1. Recruitment to the doctoral school is carried out by the Doctoral School Admissions Committee (KRSD). The course of the classification procedure is supervised by the Rector.
2. The recruitment committee consists of academic teachers holding at least a postdoctoral degree. A representative of the doctoral students' self-government may participate in the work of the committee as an observer.
3. The tasks of the Doctoral School Admissions Committee include:
   - organization of the recruitment process and ensuring the proper course of the classification of candidates at the University, in terms of content and order,
   - checking candidates' documents, completing them and preparing lists of persons subject to the classification procedure,
   - making a decision on whether or not to admit candidates to the classification procedure on the basis of the documents submitted by them,
   - conducting classification proceedings,
   - announcing the results of the classification procedure on the notice board,

- preparation of individual protocols (for each candidate) and a summary protocol,
- preparation of a ranking list of candidates, in descending order, based on the total points obtained,
- submitting a report on the course of the classification procedure to the Rector,
- preparing other information regarding recruitment for the needs of the Rector,
- giving opinions on applications for reconsideration of a negative decision on admission to the Doctoral School addressed to the Rector.

4. The Doctoral School Admissions Committee conducts the classification procedure on 24 September 2019.
5. The results of the classification procedure are announced on 25 September 2019.

## V. PROCEDURE OF APPEAL PROCEEDINGS

The decision may be subject to a request for reconsideration of the case to the Rector, through the admissions committee, within fourteen days from the date of delivery of the decision. The basis for an appeal may only be an indication of a violation of the conditions and procedure of recruitment to the doctoral school specified in this resolution. The Rector's decision is final.

## VI. SUPPLEMENTARY RECRUITMENT

l. Supplementary recruitment may be carried out for doctoral schools where the limit of places has not been filled, which is announced by the Rector at the request of the Doctoral School Admissions Committee.

2. The deadlines for accepting documents and the deadlines for the classification procedure are determined by the Rector.

3. The procedure for conducting supplementary recruitment, the composition of the recruitment committee and the rules for classifying candidates are analogous to those for basic recruitment.

## VII. DETAILED RULES FOR THE CLASSIFICATION AND ADMISSION OF CANDIDATES TO THE DOCTORAL SCHOOL

The classification procedure for candidates for the doctoral school is carried out on the basis of the ranking of the sum of points obtained according to the following criteria:

**A. Grade on the diploma of completion of second-cycle studies or long-cycle master's studies or, in the case of a person referred to in Article 186. Section 2, grade on the diploma of completion of first-cycle studies**

The admissions committee awards points according to the table:

| | |
|---|---|
| Excellent, Very Good | 10 points |
| Good, Good plus | 5 pts. |

**B. Documented level of English language proficiency**

The admissions committee awards 10 points on the basis of a C1 – Certificate in Advanced English (CAE) or C2 – Certificate of Proficiency in English (CPE) issued by Cambridge Assessment English.

**C. Compatibility of the field of study with the scientific disciplines represented in the Doctoral School**

The admissions committee awards points according to the table:

| | |
|---|---|
| Full compliance – the learning outcomes of the field of study refer to the discipline in which the candidate intends to obtain a doctoral degree | 10 points |
| Partial compliance – the learning outcomes of a field of study refer to a discipline that belongs to the same field as the discipline in which the candidate intends to obtain a doctoral degree | 5 pts. |
| Non-compliance – otherwise | 0 points |

**D. Previous scientific activity**

The admissions committee awards points according to the table:

| | |
|---|---|
| Preliminary declaration of the person of the future supervisor of the doctoral dissertation | 10 points |
| Design of research intentions | 5 pts. |
| For each peer-reviewed scientific article or active participation in a scientific conference | 5 pts. |

**E. Self-presentation of the candidate, interview**

Within a maximum of 5 minutes, the candidate characterizes his person by presenting, in his opinion, the most important achievements, interests, intentions.

As part of the interview, the committee assesses the following competencies and personality predispositions of the candidate:

a. scientific competence – understood as the ability and willingness to use the existing knowledge to explain the natural world, to formulate questions and draw evidence-based conclusions,
b. entrepreneurship – understood as a consistent pursuit of goals and the ability to put ideas into action,
c. the ability and will to learn – understood as recognizing the need for lifelong learning, the ability and willingness to acquire knowledge and new skills.

The maximum number of points awarded after the interview is 10.

The beneficiary of the "Diamond Grant" program does not take part in the interview and obtains a maximum number of 10 points.

A positive result of the qualification is that the candidate has obtained at least 20 points.

## VIII. **FINAL PROVISIONS**

1. The rules for admitting foreigners to the doctoral school are regulated by separate legal acts in force in this regard.

Appendix No. 1.1 to Resolution of the Senate of the UTP No. 9/428 of 22.05.2019

Date of receipt (to be filled in by the Dean's Office) .....

# *APPLICATION FOR ADMISSION TO THE DOCTORAL SCHOOL*

I would like to ask you to be admitted in the academic year **2019/2020** to the Doctoral School at the J. and J. Śniadecki University of Technology and Life Sciences in Bydgoszcz in the scientific discipline:

**TECHNICAL INFORMATICS AND TELECOMMUNICATIONS**
**MECHANICAL ENGINEERING**
**CHEMICAL SCIENCES**
**AGRICULTURE AND HORTICULTURE**
**ZOOTECHNICS AND FISHERIES**

| **Master data** | |
|---|---|
| **Surname** | |
| **First name(s)** | |
| **Date and place of birth** | |
| **PESEL** | |
| **Type and number of the identity document in the absence of a PESEL number** | |
| **Address** | |
| **Zip code** | |
| **Voivodeship** | |
| **Mail** | |
| **Locality** | |
| **Street** | |
| **House/apartment number** | |
| **Contact phone** | |
| **Email** | |
| **Mailing address** | |
| **Zip code** | |
| **Voivodeship** | |

| | |
|---|---|
| **Mail** | |
| **Locality** | |
| **Street** | |
| **House/apartment number** | |
| **Contact phone** | |
| **Email** | |



Appendix No. 1.1 to
Resolution of the Senate of
the UTP No. 9/428 of
22.05.2019

| **Education data** | |
|---|---|
| Full name of the completed university | |
| Year of graduation | |
| Name of the completed field of study | |
| Professional Degree | |
| Graduation Diploma Number | |

| **List of attachments** | | |
|---|---|---|
| Incl. no | Document title | Attached |
| 1. | Original or copy of the graduation diploma with a supplement | YES / NO |
| 2. | A photo compliant with the requirements for issuing ID cards in paper and electronic form | YES / NO |
| 3. | Design of research intentions | YES / NO |
| 4. | Preliminary declaration of the future supervisor of the doctoral dissertation | YES / NO |
| 5. | Certificate in Advanced English (CAE) or<br>Certificate of Proficiency in English (CPE) issued by Cambridge Assessment English | YES / NO |
| 6. | List of scientific articles and their copies | YES / NO |
| 7. | List of certificates of participation in scientific conferences and their copies | YES / NO |

| | | |
|---|---|---|
| 8. | List of documents confirming the possession of other documented professional qualifications and qualifications, together with copies | YES / NO |
| 9. | Copy of the project implementation agreement under the "Diamond Grant" program | YES / NO |
| 10. | Disability certificate issued by the voivodeship disability assessment team | YES / NO |

| **Claims** |
|---|
| I declare that I am/am not employed as an academic teacher or researcher. |
| I declare that I have/do not hold a doctoral degree. |
| I confirm the correctness of the data contained in the application and agree to the processing and use of my personal data by the J.J. Śniadecki University of Technology and Life Sciences in Bydgoszcz for the purposes of the qualification procedure and documenting the course of the education process at the doctoral school.<br><br>…….. *date*<br><br>.. …….. *PhD student's signature* |

Appendix No. 1.2 to
Resolution of the Senate of
the UTP No. 9/428 of
22.05.2019

....., .....

**DECLARATION**

**A. Promoter's personal data**

Supervisor name .....

Degree and/or degree .....

Name of the
Faculty/Department/Department.....

**B. Statement**

I hereby declare my consent to perform the function of a supervisor
Your ..... in the

field of scientific discipline .....

if, after the recruitment procedure, he/she is admitted to the Doctoral School at the J. and J. Śniadecki University of Technology and Life Sciences in Bydgoszcz.

I declare that I will provide the doctoral student with the financial and organizational conditions necessary to complete the doctoral dissertation and enable the doctoral student to develop his or her research.

..... .....
*signature of the head of the department/department*
*Promoter's signature*

.....

*Manager's signature*
*basic organisational unit*

Uniwersytet Technologiczno-Przyrodniczy
im. Jana i Jędrzeja Śniadeckich w Bydgoszczy

# ORDINANCE No. Z.6.2019.2020

**Rector of the UTP University of Science and Technology in Bydgoszcz**

of 23 September 2019

on **admission limits for the first year to the Doctoral School UTP University of Science and Technology in Bydgoszcz, in the academic year 2019/2020**

Pursuant to Article 23(1) and (2)(2) of the Act of 20 July 2018 Law on Higher Education and Science (Journal of Laws of 2018, item 1668, as amended), § 37 (2) and (4)(4) of the Statute of the University in conjunction with Article 227(3) of the Act of 3 July 2018 Provisions introducing the Act – Law on Higher Education and Science and point I of the " Terms of admission of candidates for the first academic year of the Doctoral School in the academic year 2019/2020" constituting an attachment to the Senate Resolution No. 9/428 of 22 May 2019.

**I manage**, the following:

**§ 1**

The admission limit for the Doctoral School in the academic year 2019/2020 is a total of 15 places, within the following scientific disciplines:

1) information and communication technology;
2) mechanical engineering;
3) chemical sciences;
4) agriculture and horticulture;
5) animal science and fisheries.

**§ 2**

The ordinance enters into force on the date of signing.

**R E C T O R**

Prof. Tomasz TOPOLIŃSKI

# Resolution No. 2/440 of the Senate Jan and Jędrzej Śniadecki University of Technology and Life Sciences in Bydgoszcz of 18 March 2020

concerning: the rules for admitting candidates for the first year of education to the Doctoral School of the Jan and Jędrzej Śniadecki University of Technology and Life Sciences in Bydgoszcz in the academic year 2020/2021

Based on:

- Article 200 of the Act of 20 July 2018 Law on Higher Education and Science (Journal of Laws of 2018, item 1668, as amended),

Senate of the Jan and Jędrzej Śniadecki University of Technology and Life Sciences in Bydgoszcz
Shall adopt:

I. Rules for the admission of candidates for the first year of education to the Doctoral Scots of the Jan and Jędrzej Śniadecki University of Technology and Life Sciences in Bydgoszcz in the academic year 2020/2021, constituting an annex to this resolution.

2. Resolution No. 9/428 of the Senate of the UTP of 22 May 2019 is repealed.

3. The resolution enters into force on the day of its adoption.

P Evouring Senate

przewodniczący senatu
Rektor
prof. dr hab. inż. Tomasz TOPOLIŃSKI

Prof. Dr h . an Tomasz TOPOLIŃSKI

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*CERTIFIED TRANSLATION FROM POLISH*

**Terms of admission of candidates for the first academic year**

**of the Doctoral School in the academic year of 2020/2021**

SECTION 1. SCIENTIFIC DISCIPLINES

1. The UTP University of Science and Technology in Bydgoszcz is recruiting candidates for the Doctoral School, for the academic year of 2020/2021, for the following scientific disciplines:
   1) information technology and telecommunication;
   2) mechanical engineering;
   3) chemical sciences;
   4) agriculture and horticulture;
   5) zootechnics and fisheries.
2. The university's Rector, at the request of the Director of the Doctoral School, makes the decision on commencing the recruitment, and on the places limitation in the Doctoral School.
3. The Director of the Doctoral School, after consulting the Scientific Discipline Councils, shall determine the number of places for each discipline, taking into account the state of the academic staff and post-doctoral students, and the current personnel policy of the University.

SECTION 2. TERMS OF THE CLASSIFICATION PROCEDURE

1. The basis for requesting admission to the first year of education at the Doctoral School is:
   1) the candidate holding a Master of Engineering degree or equivalent, and in the case of persons defined in Art. 186, Sec. 2 of the act – Law on Higher Education and Science, holding an engineering degree,
   2) submitting the full set of documents within the defined deadlines,
   3) meeting the requirements of the classification procedure.
2. Admission of candidates for the first year of the Doctoral School occurs within the set admission limits.
3. The admission of candidates to the doctoral school takes place by way of a competition based on the results of the classification procedure and takes the form of a ranking of the sum of points obtained by the candidate within the given discipline.

SECTION 3. REQUIRED DOCUMENTS

A candidate applying for the first year of studies at the Doctoral School is obliged to submit a set of documents, including:

1. application in accordance with the template presented in Annex no. 1;
2. copy of a diploma with an addendum confirming the acquisition of second-cycle qualifications, postgraduate programmes or, in the case of persons defined in Art. 186, Sec. 2, the original/copy of the diploma with an addendum confirming the acquisition of first-cycle qualifications;
3. One photograph meeting the requirements for issuing physical or electronic personal identification cards – at least 300x375 pixels of appropriate quality (JPG format), with the maximum size of the photograph file of 1 MB; the electronically delivered photograph should be identical to the physical photograph delivered to the university with other documents;
4. a declaration of the prospective dissertation supervisor or supervisors, or a dissertation supervisor and an assistant supervisor, in accordance with the template presented in Annex no. 2;
5. any additional documents subject to assessment in the process of recruitment, that is:
   1) language proficiency certificate;
   2) research plan;
   3) copies of scientific articles;
   4) certificates of participation in scientific conferences;
   5) documents certifying other qualifications;
6. Candidates with disabilities submit an additional disability certificate issued by a regional disability assessment board.

SECTION 4. SUBMITTING DOCUMENTS

1. The Doctoral School documents must be submitted between 1 and 21 September 2020 r.
2. The university's Rector may, at the request of the Selection Committee of the Doctoral School, decide to extend the document submission time limit, no further however than the last day preceding the classification due date.

SECTION 5. SELECTION COMMITTEE

1. The doctoral school admissions are conducted by the Selection Committee of the Doctoral School, hereinafter referred to as the "Committee", consisting of between 3 and 6 people, appointed by the Rector from among the academic staff holding at least a post-doctoral degree. At least one member of the Committee should represent the scientific discipline for which the candidate is applying.

2. A representative of the doctoral students may participate in the work of the Commission as an observer (without voting rights). Any possible comments shall be submitted to the minutes.
3. The tasks of the Committee include:
   1) organising the recruitment process and ensuring that the candidate classification procedure is conducted appropriately;
   2) assessing the candidates' documents in terms of their contents and form;
   3) formulating a list of persons included in the classification procedure;
   4) deciding on admission or non-admission of candidates for the classification procedure on the basis of the documents submitted by them;
   5) conducting the classification procedure;
   6) producing individual reports (for each candidate) and summary reports,
   7) producing a ranking list of candidates within the scientific disciplines, in descending order, based on the sum of points obtained,
   8) announcing the results of the classification procedure;
   9) preparation of recruitment information for the Rector.
4. The protocols referred to in Sec. 3, Point 6 shall be signed by all members of the Committee.
5. The Committee:
   1) carries out the classification procedure on 23 and 24 September 2020;
   2) announces the results of the classification procedure on 25 September 2020.

SECTION 6. DETAILED TERMS OF CLASSIFICATION AND ADMISSION OF CANDIDATES TO THE DOCTORAL SCHOOL

1. The classification procedure of candidates for the Doctoral School is based on the ranking of the sum of points within a scientific discipline, obtained per the following criteria:

1) the grade on the second-cycle programme diploma or on the long-cycle Master's degree programme graduation diploma or, in the case of persons defined in Art. 186, Sec. 2, the grade on the first-cycle graduation diploma

The Selection Committee awards points in accordance with the table below:

| Grade on the diploma | Points |
|---|---|
| Excellent, Very good | 10 |
| Good, Good plus | 5 |

2) proficiency in English certified with an internationally recognised certificate

The Selection Committee awards 10 points on the basis of internationally recognised English proficiency certificates: TOEFL (Test of English as a Foreign Language) at the

minimum of C1 level, IELTS (International Language Testing System) at the minimum of C1 level, CAE (Certificate in Advanced English) or CPE (Certificate of Proficiency in English).

3) the compatibility of the graduated course with the scientific disciplines taught at the Doctoral School

The Selection Committee awards points in accordance with the table below:

| Level of compatibility | Points |
|---|---|
| Full compatibility – the learning outcomes of the graduated course match the discipline in which the candidate plans to attain the doctoral degree | 10 |
| Partial compatibility – the learning outcomes of the graduated course relate to a discipline in the same scientific field as the discipline in which the candidate plans to attain the doctoral degree | 5 |
| No compatibility | 0 |

4) scientific background

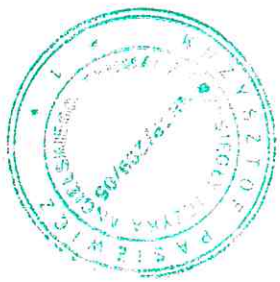
The Selection Committee awards points in accordance with the table below:

| Type of scientific activity | Points |
|---|---|
| Research plan | from 0 to 10 |
| Each scientific article published or each scientific conference actively attended | from 0 to 5 |
| Participation in research projects attained by winning contests organised by domestic and international research and R&D funding agencies | from 0 to 5 |

5) candidate self-presentation, interview

During a maximum of 5 minutes, the candidate makes a self-presentation, indicating the most important (in their opinion) scientific achievements, interests, and goals. During the interview, the Committee will assess the following competencies and personality predispositions of the candidate:

a) scientific competence – defined as the ability and willingness to use an existing body of knowledge to explain the natural world, in order to formulate questions and draw conclusions based on evidence and logical reasoning principles;
b) entrepreneurship – defined as the consistent pursuit of objectives and the ability to put ideas into practice;
c) ability and willingness to learn – seen as recognising the need for lifelong learning, the ability and desire to acquire knowledge and new skills.



The Committee awards between 0 and 10 points for the self-presentation of the candidate and for the review.

2. A successful candidate will have obtained at least 25 points.

**SECTION 7. ANNOUNCEMENT OF RESULTS**

1. The results of the recruitment procedure are non-confidential. The results shall be made public by the names of persons admitted and not admitted for the first year of the Doctoral School being posted on a notice board in front of the Doctoral School Office (Office of the Faculty of Mechanical Engineering).
2. The admission to the doctoral school is made by way of registration on the list of doctoral students.
3. The refusal of admission to the doctoral school is an administrative decision.
4. The procedure of appealing against the decisions referred to in Sec. 3 is defined in SECTION 28 of the Regulations of the Doctoral School.

SECTION 8. SUPPLEMENTARY ADMISSIONS

1. If the admission limit is not reached, supplementary admission procedure may be conducted.
2. Supplementary admission procedure is announced by the Rector ar the request of the Committee.
3. The new time limits for submitting documents and new dates for conducting the classification procedure shall be defined by the Rector.
4. The provisions of the preceding paragraphs shall apply in the context of supplementary recruitment in regards to its conduct, the composition of the Commission, and the rules for candidates classification.

Herewith I, **Krzysztof Pasiewicz M.A.**, **Sworn Translator in English, TP/209/05,**
certify this to be a true and correct translation of the Polish document presented to me.
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Bydgoszcz, **November 09 , 2020** Index No. **1478 /20**
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*CERTIFIED TRANSLATION FROM POLISH*

Annex no. 1 to the Terms of Admission to the Doctoral School
of the UTP University of Science and Technology
in Bydgoszcz

Date of submission (use of the Faculty Office only) .....

# *APPLICATION FOR ADMISSION TO THE DOCTORAL SCHOOL*

I hereby request to be admitted to the Doctoral School of the UTP University of Science and Technology in Bydgoszcz, for the academic year **2020/2021**, in the scientific discipline of:

- € **INFORMATION TECHNOLOGY AND TELECOMMUNICATION**
- € **MECHANICAL ENGINEERING**
- € **CHEMICAL SCIENCES**
- € **AGRICULTURE AND HORTICULTURE**
- € **ZOOTECHNICS AND FISHERIES**

| **Basic personal data** | |
|---|---|
| **Last name** | |
| **First name (names)** | |
| **Date and place of birth** | |
| **PESEL *[Personal ID no.]*** | |
| **Type and number of a personal ID document in case of lack of PESEL** | |
| **Address of residence** | |
| **Postcode** | |
| **Province** | |
| **Post office** | |
| **City** | |
| **Street** | |
| **House/apartment number** | |
| **Phone number** | |
| **E-mail address** | |

| **Correspondence address** | |
|---|---|
| **Postcode** | |
| **Province** | |
| **Post office** | |
| **City** | |
| **Street** | |
| **House/apartment number** | |
| **Phone number** | |
| **E-mail address** | |

| **Education** | |
|---|---|
| Full name of high school | |
| Year of graduation from high school | |
| University course completed | |
| Degree attained | |
| University course diploma number | |

**List of annexes**

| Annex no. | Document | Attached |
|---|---|---|
| 1. | University course diploma with addendums or its copy | YES / NO |
| 2. | Photograph meeting the requirements for issuing physical or electronic personal identification cards | YES / NO |
| 3. | Draft of research plans | YES / NO |
| 4. | Preliminary declaration of the prospective doctoral dissertation supervisor | YES / NO |
| 5. | Internationally recognised certificate of English proficiency: TOEFL, IELTS, CAE, or CPE | YES / NO |
| 6. | List of scientific articles and copies thereof | YES / NO |
| 7. | List of scientific conference attendance certificates and copies thereof | YES / NO |
| 8. | List of documents confirming attainment of research funding by winning contests organised by domestic or international research and R&D funding agencies | YES / NO |
| 9. | List of documents confirming other certifiable qualifications and professional qualifications with copies thereof | YES / NO |
| 10. | Disability certificate issued by a regional disability assessment board | YES / NO |

| **Declarations** |
|---|
| I declare that I am / I am not employed in the position of an academic teacher or a researcher. |
| I declare that do / do not have a doctoral degree. |
| I declare the personal data provided in this application to be true and I consent to my personal data being processed and used by the Uniwersytet Techniczno-Przyrodniczy im. J.J. Śniadeckich w Bydgoszczy *[UTP University of Science and Technology in Bydgoszcz]* for the purposes of recruitment and documenting the process of education in the doctoral school.<br><br>…… …… …… …… ……<br>*date* …… …… …… …… …… …… …… …… ……<br>*signature of the doctoral student candidate* |

Herewith I, **Krzysztof Pasiewicz M.A., Sworn Translator in English, TP/209/05,**
certify this to be a true and correct translation of the Polish document presented to me.
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Bydgoszcz, **November 09 , 2020** Index No. **1748 /20**

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*CERTIFIED TRANSLATION FROM POLISH*

Annex no. 2 to the Terms of Admission to the Doctoral School
of the UTP University of Science and Technology
in Bydgoszcz

....., on .....
*(place)* *(date)*

**D E C L A R A T I O N S**

**A. Personal data of the dissertation supervisor**

First and last names of the supervisor .....

Scientific title and/or degree .....

Name of the Faculty/Institute/Board.....

**B. Declaration**

I hereby declare my consent for becoming a dissertation supervisor of

Mr/Mrs .....

in the discipline of mechanical engineering, chemical sciences, agriculture and horticulture, zootechnics and fisheries/* as part of the Doctoral School of the UTP University of Technology and Science in Bydgoszcz.

.....
*signature of the supervisor*

**C. Personal data of the second dissertation supervisor**

First and last names of the supervisor .....

Scientific title and/or degree .....

Name of the Faculty/Institute/Board.....

PASIEWICZ JĘZYKA ANGIELSKIEGO TŁUMACZ PRZYSIĘGŁY NR TP/2009/05

**D. Declaration**

I hereby declare my consent for becoming a dissertation supervisor of

Mr/Mrs .....

in the discipline of mechanical engineering, chemical sciences, agriculture and horticulture, zootechnics and fisheries/* as part of the Doctoral School of the UTP University of Technology and Science in Bydgoszcz.

.....

*signature of the second supervisor*

**E. Personal data of the assistant supervisor**

First and last names of the supervisor .....

Scientific title and/or degree .....

Name of the Faculty/Institute/Board.....

**F. Declaration**

I hereby declare my consent for becoming a dissertation supervisor of

Mr/Mrs .....

in the discipline of mechanical engineering, chemical sciences, agriculture and horticulture, zootechnics and fisheries/* as part of the Doctoral School of the UTP University of Technology and Science in Bydgoszcz.

.....

*signature of the assistant supervisor*

I declare that I will ensure that the doctoral student has the financial and organisational means necessary to produce a doctoral dissertation and that I will facilitate the scientific development of the doctoral student.

.....
*signature of the head of the faculty/institute*

.....
*signature of the head of the scientific discipline*

.....
*signature of the Dean*

Herewith I, **Krzysztof Pasiewicz M.A., Sworn Translator in English, TP/209/05,**
certify this to be a true and correct translation of the Polish document presented to me.
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Uniwersytet Technologiczno-Przyrodniczy
im. Jana i Jędrzeja Śniadeckich w Bydgoszczy

# ORDINANCE No. Z.12.2020.2021

**Rector of the UTP University of Science and Technology in Bydgoszcz**

of 23 September 2020

on **admission limits for the first year to the Doctoral School UTP University of Science and Technology in Bydgoszcz, in the academic year 2020/2021**

Pursuant to Article 23(1) and (2)(2) of the Act of 20 July 2018 Law on Higher Education and Science (Journal of Laws of 2020, item 85, as amended) and § 1(2) of the "Terms of admission of candidates for the first academic year of the Doctoral School in the academic year 2020/2021" constituting an attachment to the Senate's Resolution No. 2/440 of 18 March 2020 and the motion of the Director of the Doctoral School of 22 June 2020.

**I hereby order** as follows:

**§ 1**

The admission limit to the Doctoral School of the UTP University of Science and Technology in Bydgoszcz in the academic year 2020/2021 is a total of 23 places.

**§ 2**

The ordinance enters into force on the date of signing.

**RECTOR**

Professor Marek ADAMSKI

# Resolution No. 1/453

## Senate

## University of Technology and Life Sciences

Jan and Jędrzej Śniadecki

## in Bydgoszcz

## of 20 January 2021

**on the adoption of the Rules for the admission of candidates for the first year of education to the Doctoral School of the Jan and Jędrzej Śniadecki University of Technology and Life Sciences in Bydgoszcz in the academic year 2021/2022**

Pursuant to: Article 200(2) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2020, item 85, as amended)

*Senate*

*University of Technology and Life Sciences*

*Jan and Jędrzej Śniadecki in Bydgoszcz*

***resolves*** *as follows:*

**§ 1**

The Rules for Admitting Candidates for the First Year of Education to the Doctoral School in the Academic Year 2021/2022, attached to this Resolution, are hereby adopted.

**§ 2**

The resolution enters into force on the day of its adoption.

**President of the Senate**

**Rector**

**prof. dr hab. inż. Marek ADAMSKI**

**Terms of admission of candidates for the first academic year of the Doctoral School in the academic year of 2021/2022**

## SECTION 1. SCIENTIFIC DISCIPLINES

1. The UTP University of Science and Technology in Bydgoszcz is recruiting candidates for the Doctoral School, for the academic year of 2020/2021, for the disciplines in which the university is authorized to award doctoral degree.

## SECTION 2. TERMS OF THE CLASSIFICATION PROCEDURE

1. The basis for requesting admission to the first year of education at the Doctoral School is:
   1) the candidate holding a Master of Engineering degree or equivalent, and in the case of persons defined in Art. 186, Sec. 2 of the act— Law on Higher Education and Science, holding an engineering degree,
   2) submitting the full set of documents within the defined deadlines,
   3) meeting the requirements of the classification procedure.
2. Admission of candidates for the first year of the Doctoral School occurs within the set admission limits.
3. The admission of candidates to the doctoral school takes place by way of a competition based on the results of the classification procedure and takes the form of a ranking of the points obtained by the candidate within the given discipline.
4. In the scientific discipline more doctoral students might be admitted than it results from the proposal of the Discipline Councils, provided that the total number of limit places is not exceeded.
5. Doctoral students are recruited separately for the Polish and English language groups.

## SECTION 3. REQUIRED DOCUMENTS

A candidate applying for the first year of studies at the Doctoral School is obliged to submit a set of documents, including:

1. application in accordance with the template presented in Annex no. 1;
2. copy of a diploma with an addendum confirming the acquisition of second-cycle qualifications, postgraduate programmes or, in the case of persons defined in Art. 186, Sec. 2, the original/copy of the diploma with an addendum confirming the acquisition of first-cycle qualifications;
3. One photograph meeting the requirements for issuing physical or electronic personal identification cards — at least 300x375 pixels of appropriate quality (JPG format), with the maximum size of the photograph file of 1 MB; the electronically delivered photograph should be identical to the physical photograph delivered to the university with other documents;

4. a declaration of the prospective dissertation supervisor or supervisors, or a dissertation supervisor and an assistant supervisor, in accordance with the template presented in Annex no. 2;
5. any additional documents subject to assessment in the process of recruitment, that is:
   1) research plan;
   2) language proficiency certificate;
   3) copies of scientific articles along with a table containing the current scores based on the list published by Ministry of Education and Science;
   4) copies of certificates of an active participation in scientific conferences along with a tabular summary;
   5) copies of obtained patents, utility or industrial models along with a tabular summary;
   6) copies of documents confirming participation in research projects obtained through competition conducted by national and international agencies financing scientific and research and development projects;
6. Candidates with disabilities submit an additional disability certificate issued by a regional disability assessment board.

## SECTION 4. SUBMITTING DOCUMENTS

1. The Doctoral School documents must be submitted between 6 and 10 September 2021 r until 14.00.
2. The university's Rector may, at the request of the Selection Committee of the Doctoral School, decide to extend the document submission time limit, no further however than the last day preceding the classification due date.
3. Candidates for the Doctoral School, indicated as contractors in the research projects obtained through a competition and financed from external sources, may be recruited during the academic year, if so provided for in the grant application processing schedule

## SECTION 5. SELECTION COMMITTEE

1. The doctoral school admissions are conducted by the Selection Committee of the Doctoral School, hereinafter referred to as the "Committee", consisting of between 3 and 6 people, appointed by the Rector from among the academic staff holding at least a post-doctoral degree. At least one member of the Committee should represent the scientific discipline for which the candidate is applying.

2. A representative of the doctoral students may participate in the work of the Commission as an observer (without voting rights). Any possible comments shall be submitted to the minutes.
3. The tasks of the Committee include:
   1) organising the recruitment process and ensuring that the candidate classification procedure is conducted appropriately;
   2) assessing the candidates' documents in terms of their contents and form;
   3) formulating a list of persons included in the classification procedure;
   4) deciding on admission or non-admission of candidates for the classification procedure on the basis of the documents submitted by them;
   5) conducting the classification procedure;
   6) producing individual reports (for each candidate) and summary reports,

7) producing a ranking list of candidates within the scientific disciplines, in descending order, based on the sum of points obtained,
8) announcing the results of the classification procedure;
9) preparation of recruitment information for the Rector.

4. The protocols referred to in Sec. 3, Point 6 shall be signed by all members of the Committee.
5. The Committee:
   1) carries out the classification procedure on 14 and 15 September 2021;
   2) announces the results of the classification procedure on 16 September 2021.
6. In the case of doctoral students referred to in §4.3, the Commission shall conduct the procedure within the time limit resulting from the candidates' submission and announce the results on the next working day after the end of the procedure.

## SECTION 6. DETAILED TERMS OF CLASSIFICATION AND ADMISSION OF CANDIDATES TO THE DOCTORAL SCHOOL

1. The classification procedure of candidates for the Doctoral School is based on the ranking of the sum of points within a scientific discipline, obtained per the following criteria:

I) the grade on the second-cycle programme diploma or on the long-cycle Master's degree programme graduation diploma or, in the case of persons defined in Art. 186, Sec. 2, the grade on the first-cycle graduation diploma

The Selection Committee awards points in accordance with the table below:

| Grade on the diploma | Points |
|---|---|
| Excellent, Very good | 10 |
| Good, Good plus | 5 |

2) proficiency in English certified with an internationally recognised certificate

The Selection Committee awards 10 points on the basis of internationally recognised proficiency certificates: TOEFL (Test of English as a Foreign Language) at the minimum of Cl level, IELTS (International Language Testing System) at the minimum of Cl level, CAE (Certificate in Advanced English) or CPE (Certificate of Proficiency in English).

3) the compatibility of the graduated course with the scientific disciplines taught at the Doctoral School

The Selection Committee awards points in accordance with the table below:

| Level of compatibility | Points |
|---|---|
| Full compatibility — the learning outcomes of the graduated course match the discipline in which the candidate plans to attain the doctoral degree | 10 |
| Partial compatibility — the learning outcomes of the graduated course relate to a discipline in the same scientific field as the discipline in which the candidate plans to attain the doctoral degree | 5 |
| No compatibility | 0 |

4) scientific background

The Selection Committee awards points in accordance with the table below:

| Type of scientific activity | Points |
|---|---|
| Research plan | from 0 to 10 |
| Each scientific article published or each scientific conference actively attended | from 1 to 5 |
| Each patent, utility or industrial model | from 1 to 5 |
| Participation in research projects attained by winning contests organised by domestic and international research and R&D funding agencies | from 1 to 5 |

5) candidate self-presentation, interview

During a maximum of 5 minutes, the candidate makes a self-presentation, indicating the most important (in their opinion) scientific achievements, interests, and goals. During the interview, the Committee will assess the following competencies and personality predispositions of the candidate:

a) scientific competence —defined as the ability and willingness to use an existing body of knowledge to explain the natural world, in order to formulate questions and draw conclusions based on evidence and logical reasoning principles;
b) entrepreneurship — defined as the consistent pursuit of objectives and the ability to put ideas into practice;
c) ability and willingness to learn — seen as recognising the need for lifelong learning, the ability and desire to acquire knowledge and new skills.

The Committee awards between 0 and 10 points for the self-presentation of the candidate and for the review.

5. A successful candidate will have obtained at least 30 points.

## SECTION 7. ANNOUNCEMENT OF RESULTS

1. The results of the recruitment procedure are non-confidential.
2. The results shall be made public by the names of persons admitted and not admitted for the first year of the Doctoral School being posted on a notice board in front of the Doctoral School Office.
3. The admission to the doctoral school is made by way of registration on the list of doctoral students.
4. The refusal of admission to the doctoral school is an administrative decision.
5. The procedure of appealing against the decisions referred to in Sec. 3 is defined in SECTION 28 of the Regulations of the Doctoral School.

## SECTION 8. SUPPLEMENTARY ADMISSIONS

1. If the admission limit is not reached, supplementary admission procedure may be conducted.

2. Supplementary admission procedure is announced by the Rector at the request of the Committee.
3. The new time limits for submitting documents and new dates for conducting the classification procedure shall be defined by the Rector.
4. The provisions of the preceding paragraphs shall apply in the context of supplementary recruitment in regards to its conduct, the composition of the Commission, and the rules for candidates classification.

Annex no.1 to the Terms of Admission to the Doctoral School
of the Bydgoszcz University of Science and Technology

Date of submission (use of the Faculty Office only) ……

# *APPLICATION FOR ADMISSION TO THE DOCTORAL SCHOOL*

I hereby request to be admitted to the Doctoral School of the Bydgoszcz University of Science and Technology, for the academic year 2021/2022, in the scientific discipline of:

- ***AUTOMATION, ELECTRONICS AND ELECTRICAL ENGINEERING***
- ***CIVIL ENGINEERING AND TRANSPORT***
- ***INFORMATION TECHNOLOGY AND TELECOMMUNICATION***
- ***MECHANICAL ENGINEERING***
- ***CHEMICAL SCIENCES***
- ***AGRICULTURE AND HORTICULTURE***
- ***ZOOTECHNICS AND FISHERIES***

| **Basic personal data** | |
|---|---|
| Last name | |
| First name (names) | |
| Date and place of birth | |
| PESEL [Personal ID no.] | |
| Type and numer of a personal ID document in case of lack of PESEL | |
| **Address of residence** | |
| Postcode | |
| Province | |
| Post office | |
| City | |
| Street | |
| House/apartment number | |
| Phone number | |
| E-mail address | |

| **Correspondence address** | |
|---|---|
| Postcode | |
| Province | |
| Post office | |
| City | |
| Street | |
| House/apartment number | |
| Phone number | |
| **Education** | |
| Full name of high school | |
| Year of graduation from high school | |
| University course completed | |
| Degree attained | |
| University course diploma numer | |

**List of annexes**

| Annex no. | Document | Attached |
|---|---|---|
| 1. | University cource diploma with addendums or its copy | YES / NO |
| 2. | Photograph meeting the requiremens for issuing physical or electronic personal identification cards | YES / NO |
| 3. | Draft of research plans | YES / NO |
| 4. | Preliminary declaration of the prospective doctoral dissertation supervisor | YES / NO |
| 5. | Internationally recognised certificate of English proficiency: TOEFL, IELTS, CAE, or CPE | YES / NO |
| 6. | List of scientific articles and copies thereof | YES / NO |
| 7. | List of scientific conference attendance certificates and copiec thereof | YES / NO |
| 8. | List of documents confirming attaintment of research funding by winning contests organised by domestic or international research and R&D funding agencies | YES / NO |
| 9. | List of documents confirming other certifiable qualifications and professional qualifications with copies thereof | YES / NO |
| 10. | Disability certificate issued by a regional disability assessment board | YES / NO |

| **Declarations** |
| --- |
| I declare that i am / Iam not employed in the position of an academic teacher or a researcher. |
| I declare that do / do not have a doctoral degree. |
| I declare the personal data provided in this application to be true and I consent to my personal data being processed and used by the Politechnika Bydgoska im. Jana i Jędrzeja Śniadeckich w Bydgoszczy [Bydgoszcz University of Science and Technology] for the purposes of recruitment and documenting the proces of education in the doctoral school.<br><br>…… date<br>…… signature of the doctoral student candidate |

Annex no. 2 to the Terms of Admission to the Doctoral School
of the Bydgoszcz University of Science and Technology

……, on ……
(place) (date)

# *DECLARATIONS*

## A. Persona data of the dissertation supervisor

First and last names of the supervisor ……

Scientific title and/or degree ……..

Name of the Faculty/Institute/Board ……..

**Declaration**

I hereby declare my consent for becoming a dissertation supervisor of

Mr/Mrs ……..……

in the discipline of automation, electronics and electrical engineering, civil engineering and transport, information technology and telecommunication, mechanical engineering, chemical sciences, agriculture and horticulture, zootechnics and fisheries, automation, electronic and electrical engineering, civil engineering and transport/* as part of the Doctoral School of the Bydgoszcz University of Science and Technology.

……
signature of the supervisor

## B. Personal data of the second dissertation supervisor

First and last names of the supervisor ……..……..

Scientific title and/or degree ……..……..

Name of the Faculty/Institute/Board ……..……

**Declaration**

I hereby declare my consent for becoming a dissertation supervisor of

Mr/Mrs ……..……

in the discipline of automation, electronics and electrical engineering, civil engineering and transport, information technology and telecommunication, mechanical engineering, chemical sciences, agriculture and horticulture, zootechnics and fisheries, automation, electronic and electrical engineering, civil engineering and transport /* as part of the Doctoral School of the Bydgoszcz University of Science and Technology.

……
signature of the second supervisor

## C. Personal data of the assistant supervisor

First and last names of the supervisor ……..……..

Scientific title and/or degree …….……..

Name of the Faculty/Institute/Board ……..…….

**Declaration**

I hereby declare my consent for becoming a dissertation supervisor of

Mr/Mrs …….……

in the discipline of automation, electronics and electrical engineering, civil engineering and transport, information technology and telecommunication, mechanical engineering, chemical sciences, agriculture and horticulture, zootechnics and fisheries, automation, electronic and electrical engineering, civil engineering and transport /* as part of the Doctoral School of the Bydgoszcz University of Science and Technology.

……
signature of the assistant supervisor

## D. Statement by the Chair of the Academic Discipline Council

I declare that I will ensure that the doctoral student has the financial and organisational means necessary to produce a doctoral dissertation and that I will facilitate the scientific development of the doctoral student.

……

Signature of the head of the scientific discipline

Uniwersytet Technologiczno-Przyrodniczy
im. Jana i Jędrzeja Śniadeckich w Bydgoszczy

# ORDINANCE No. Z.179.2020.2021

**Rector of the UTP University of Science and Technology in Bydgoszcz**

of 23 June 2021

**on admission limits for the first year to the Doctoral School of the UTP University of Science and Technology in Bydgoszcz, in the academic year 2021/2022**

Pursuant to Article 23(1) and (2)(2) of the Act of 20 July 2018 Law on Higher Education and Science (Journal of Laws of 2021, item 478 and item 619) in conjunction with § 171(2) of the Statute of the UTP University of Science and Technology in Bydgoszcz and the motion of the Director of the Doctoral School of 16 June 2021.

**I hereby order** as follows:

**§ 1**

The admission limit to the Doctoral School of the UTP University of Science and Technology in Bydgoszcz in the academic year 2021/2022 is a total of 25 places.

**§ 2**

The ordinance enters into force on the date of signing.

**RECTOR**

Professor Marek ADAMSKI

POLITECHNIKA
BYDGOSKA
im. Jana i Jędrzeja Śniadeckich

# ORDINANCE No. Z.24.2021.2022
## Rector of the Bydgoszcz University of Science and Technology

of 15 October 2021

**amending the Ordinance No. Z.179.2020.2021 of June 23, 2021 on the admission limits for the first year to the Doctoral School of the UTP University of Science and Technology in Bydgoszcz, in the academic year 2021/2022**

Pursuant to Article 23(1) and (2)(2) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2021, items 478, 619 and 1630), § 171 (2) of the Statute of the Bydgoszcz University of Science and Technology in connection with the motion of the Director of the Doctoral School of 12 October 2021.

**I hereby order** as follows:

**§ 1**

In the Ordinance No. Z.179.2020.2021 of June 23, 2021 on the admission limits for the first year to the Doctoral School of the UTP University of Science and Technology in Bydgoszcz, in the academic year 2021/2022 in § 1, the number *"25"* is replaced by the number "*27*".

**§ 2**

The ordinance enters into force on the date of signing.

**RECTOR**

Professor Marek ADAMSKI

POLITECHNIKA
BYDGOSKA
im. Jana i Jędrzeja Śniadeckich

# ORDINANCE No. Z.147.2021.2022

**Rector of the Bydgoszcz University of Science and Technology**

of 3 June 2022

**amending the Ordinance No. Z.179.2020.2021 of June 23, 2021 on the admission limits for the first year to the Doctoral School of UTP University of Science and Technology in Bydgoszcz, in the academic year 2021/2022**

Pursuant to Article 23(1) and (2)(2) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2022, items 574, 583, 655, 682 and 1010) and § 171(2) of the Statute of the Bydgoszcz University of Science and Technology [1], the following is ordered:

**§ 1.** In the Ordinance No. Z.179.2020.2021 of June 23, 2021 on the admission limits for the first year to the Doctoral School of the UTP University of Science and Technology in Bydgoszcz, in the academic year 2021/2022 in § 1, the number "27" is replaced by the number "28".

**§ 2.** The ordinance enters into force on the date of signing.

**RECTOR**

Professor Marek ADAMSKI

[1] The Statute of the Bydgoszcz University of Technology introduced by the Senate's Resolution No. 1/430 of 26 June 2019, amended by the Senate's Resolution No. 6/456 of 24 March 2021, Senate's Resolution No. 5/459 of 23 June 2021 and Senate's Resolution No. 1/460 of 14 July 2021.

TECHNICAL UNIVERSITY
BYDGOSKA named after Jan and
Jędrzej Śniadecki

# Resolution No. 6/466 of the Senate Bydgoszcz University of Science and Technology 15 December 2021

concerning: the adoption of the Rules for the admission of candidates for the first year of education to the Doctoral School

Bydgoszcz University of Science and Technology

Pursuant to: Article 200(2) of the Act of 20.07.2018 — Law on Higher Education and Science (Journal of Laws of 2021, item 478, as amended)

Senate
of the Bydgoszcz University
of Science and Technology
resolves as follows:

§1

The Principles of Admitting Candidates for the First Year of Education to the Doctoral School of the Bydgoszcz University of Science and Technology, which are attached to this Resolution, are hereby adopted.

§2

The resolution enters into force on the day of its adoption.

Senate Chairmen

Rector

prof. dr hab. inż. M. ADAMSKI

# Principles of admitting candidates for the first year of education to the Doctoral School of Bydgoszcz University of Science and Technology

## § 1
## RULES OF THE RECRUITMENT PROCEDURE

1. Bydgoszcz University of Science and Technology is recruiting candidates for the PBS Doctoral School in the field of scientific disciplines in which the University has the right to award doctoral degrees and provided that the scientific councils of these disciplines have reported a need to educate doctoral students in these disciplines.
2. The basis for applying for admission to the 1st year of education at the PBS Doctoral School is:
   1) the candidate holds the vocational master's or master's in engineering degree or any other equivalent title, and in the case of the candidates referred to in Art. 186 paragraph 2 of the Act – Law on Higher Education and Science (hereinafter referred to as the Act), holding the vocational title of the engineer;
   2) submission of a complete set of documents within the deadlines;
   3) meeting the requirements of the classification procedure.
3. Admission of candidates for the 1st year of the PBS Doctoral School takes place within the admission limits, resulting from the sum of admission limits for doctoral students proposed by individual Scientific Discipline Councils.
4. The Rector sets a separate admission limit for candidates to the PBS Doctoral School indicated as contractors or persons recruited to carry out research projects obtained through a competition and financed from external sources,.
5. The admission limits and the schedule of the classification procedure are set by the Rector and announced on the website of the PBS Doctoral School no later than two months before the recruitment begins.
6. Candidates referred to in point 4, may be recruited during the academic year, if stipulated in schedule for examining grant applications, provided that the doctoral scholarship is fully financed from the project for a period of at least 3 years from the date of commencement of education at the PBS Doctoral School.
7. Candidates are admitted to the PBS Doctoral School by way of a competition, based on the results of the classification procedure, and is a ranking of the sum of points obtained by the candidate within the discipline.
8. If the candidates obtain the same number of points, the order in the ranking list is determined on the basis of the average grade from the cycle of studies (up to 2 decimal places).
9. Recruitment of doctoral students is carried out separately for the Polish and English language groups.

## § 2
## REQUIRED DOCUMENTS

1. Candidates applying for admission to the 1st year of education at the PBS Doctoral School is obliged to submit a complete set of documents containing:
   1) the Admission Form according to the template constituting Annex No. 1;

2) originals/copies/notarized copies of diplomas along with supplements confirming obtaining first and second cycle qualifications, uniform master's studies or, in the case of a person referred to in Art. 186 paragraph. 2; the original/copy /notarized copy of the diploma along with a supplement confirming the first cycle qualification. In the absence of a diploma due to waiting for its issuance, the candidate should submit a certificate from the university on the defense of the thesis together with the calculation of the average grade for the studies. In such circumstances, the candidate provides a copy of the diploma with a supplement to the files immediately after receiving them;
3) confirmation of recognition of the foreign diploma in the Republic of Poland by the National Agency for Academic Exchange, in the case of persons holding a diploma from a foreign university;
4) one photo compliant with the requirements for issuing identity cards and an electronic photo with a size of at least 500x650 pixels of appropriate quality (JPG format), maximum 1 MB photo file size; the electronic photo should be identical to the photo "on paper" and should be delivered to the university together with other documents;
5) consent of the future supervisor or supervisors, or additional supervisor and assistant supervisor of the doctoral dissertation according to the template constituting Annex No. 2;
6) planned research project;
7) self-declaration of command of the English language sufficient to allow for the implementation of education for candidates for the English-speaking group;
8) declaration on the source of financing of the doctoral scholarship for a period of at least 3 years from the date of commencement of education at the Doctoral School in relation to the candidates referred to in §1 point 4;

2. In the case of candidates residing outside Poland, it is allowed to send scans of the documents referred to in sec. 1 to the email address: szkola.doktorska@pbs.edu.pl, provided that they present the originals for the Recruitment Committee files upon arrival. Failure to provide the original documents is tantamount to resignation from education, as referred to in Art. 203 paragraph. 1 point 3 of the Act, and results in deletion from the list of doctoral students of the PBS Doctoral School.
3. The candidate may submit other documents subject to assessment during the recruitment, in particular:
   1) declaration of support for the entity of the social and economic environment in the implementation of the research project
   2) tabular list of scientific articles with journal scores and their copies
   3) list of certificates of active participation in scientific conferences with their copies
   4) tabular list of patents with their copies.
   5) list of documents confirming financing of participation in research projects obtained through competitions conducted by national and international agencies financing scientific and research and development activities
4. Candidates who are disabled persons shall additionally submit a disability certificate issued by the competent Disability Evaluation Board.

## § 3
## SUBMITTING DOCUMENTS

1. The complete set of admission documents to the PBS Doctoral School should be submitted to the PBS Doctoral School Office within the time limit set in accordance with §1 point 5.
2. In the case of sending documents via a postal operator, the date of submission of the documents is the date of their receipt by the PBS Doctoral School.
3. Upon the expiry of the deadline for submitting documents for admission to the PBS Doctoral School established in accordance with §1 point 5, the right to submit or supplement the application shall expire. Supplementing applications after this date is ineffective.
4. A correctly submitted application for admission to the Doctoral School is the basis for performing activities in the qualification procedure.
5. An incomplete application or an application with other deficiencies which make it impossible to determine the information necessary for the qualification procedure shall not be considered. The Chairperson of the Recruitment Committee notifies the candidate about this fact.

## § 4
## RECRUITMENT COMMITTEE

1. Recruitment competition procedure to the PBS Doctoral School is carried out by the Recruitment Committee of the PBS Doctoral School, hereinafter referred to as the "Committee". The Committee is appointed by the Rector from among the academic teachers with at least the academic degree of habilitated doctor. The Committee meets in three-person formations appointed by the Chairperson of the Committee for candidates from particular disciplines, and at least one person from the composition should represent the discipline in which the candidate is applying for admission.
2. If one of the members of the formation is a potential supervisor previously indicated by the candidate, they shall not participate in the evaluation of this candidate.
3. A representative of the doctoral students' government may participate in the work of the Committee as an observer without voting rights. Any observations are reported by the observer for the record in a protocol.
4. The tasks of the Committee include:
   1) organization of the recruitment process and ensuring the proper conduct of the classification of candidates;
   2) checking the candidates' documents in terms of content and form;
   3) preparation of lists of persons covered by the classification procedure;
   4) making a decision on admitting or not admitting candidates to the classification procedure on the basis of the documents submitted by them;
   5) carrying out the classification procedure;
   6) preparation of individual protocols for each candidate and a summary report;
   7) preparation of a ranking list of candidates within the disciplines, in descending order, based on the sum of points obtained;
   8) announcement of the results of the classification procedure;
   9) preparing information on recruitment for the needs of the Rector.
5. The protocols referred to in §4 point 6 are signed by all members of the Committee.

## § 5
## DETAILED RULES FOR RECRUITMENT AND ADMISSION OF CANDIDATES TO THE PBS DOCTORAL SCHOOL

1. The recruitment procedure for candidates for the PBS Doctoral School is based on the ranking of the sum of points within the discipline, obtained according to the following criteria:

   1) the grade on the diploma of completion of second-cycle studies or uniform master's studies or, in the case of a person referred to in Art. 186 par. 2, grade on the diploma of completion of first-cycle studies

      The Recruitment Committee awards points according to the table:

| grade on the diploma | points |
|---|---|
| 6.0-5.0 | 10 |
| 4.0-4.5 | 5 |

   2) compliance of the first- or second-cycle studies with the scientific disciplines represented within the PBS Doctoral School

      The Recruitment Committee awards points according to the table:

| level of compliance | points |
|---|---|
| full compliance – learning outcomes in the fields of study refer to the discipline in which the candidate intends to obtain a doctoral degree | 10 |
| partial compliance – learning outcomes in the fields of study refer to a discipline that belongs to the same field as the discipline in which the candidate intends to obtain a doctoral degree | 5 |
| no compliance – learning outcomes in the fields of study relate to another field | 0 |

   3) candidate's research plans:

      The Recruitment Committee awards points according to the table:

| characteristics of research plans | points |
|---|---|
| planned research project | from 0 to 10 |
| declaration of support for the subject of the socio-economic environment in the implementation of the candidate's scientific plans by providing research equipment or co-financing research. | from 1 to 5 |

   4) previous scientific activity:

      The Recruitment Committee awards points according to the table:

| type of scientific activity | points |
|---|---|
| for each published scientific article;<br>Scoring for scientific articles is calculated on the basis of | from 1 to 10 |

| | |
|---|---|
| the Ministry of Science and Higher Education score in such a way that the number of points for an article is divided by the maximum number of points on ministerial lists and multiplied by 10. | |
| for active participation in a scientific conference;<br>local conferences receive from 1 to 2 points, national conferences from 3 to 4, international conferences 5 points. | from 1 to 5 |
| for each patent, utility or industrial model | from 1 to 5 |
| for each participation in research projects obtained through competitions conducted by national and international agencies financing scientific and research and development activities<br>The maximum number of points is earned for stand-alone grants or grant management | from 1 to 5 |

5) candidate's self-presentation and interview:

The candidate makes a maximum 5-minute self-presentation, indicating the most important achievements, interests and scientific intentions. During the interview, the Committee assesses the following competences and personality predispositions of the candidate:

a) scientific competence – candidate's ability and willingness to use the existing resource of knowledge to explain the world, in order to formulate questions and draw conclusions based on evidence and the principles of logical reasoning;
b) entrepreneurship – candidate's consistent pursuit of goals and the ability to turn ideas into action;
c) the ability and will to learn – candidate's perception of the need for lifelong learning, the ability and willingness to acquire knowledge and new skills.

The Committee awards from 0 to 10 points for the candidate's self-presentation and interview.

The candidate whose position on the ranking list, after adding up the number of points for criteria from 1 to 4 and assuming the maximum number of points in the interview, gives a chance to be admitted to the PBS Doctoral School.

6) A positive result of the recruitment procedure is when the candidate has obtained at least 30 points.

2. In justified cases, the recruitment procedure may be conducted remotely with the use of commonly available internet tools, as long as the influence of third parties on the course of the procedure is ruled out.
3. Before starting the self-presentation and interview, the Chairperson verifies the candidate's identity. In justified cases, they may ask the candidate to present an identity card for inspection. In the case of candidates who are not Polish citizens, another document, in particular a passport, shall be required.

## § 6
## ANNOUNCEMENT OF RESULTS

1. The results of the recruitment procedure are public.
2. The results with the personal lists of persons admitted and not admitted to the first year of education are made public on the website of the Bydgoszcz University of Science and Technology in the tab dedicated to recruitment to the PBS Doctoral School.
3. The results are announced within 7 working days from the end of the interview stage.
4. Doctoral students are admitted to the PBS Doctoral School by way of list entry.
5. Admission or refusal to admit to the PBS Doctoral School for a person who is not a Polish citizen takes place by way of an administrative decision of the Rector.
6. Refusal of admission to the PBS Doctoral School is made by way of an administrative decision issued by the Director of the PBS Doctoral School.
7. From the negative decision on the admission to the PBS Doctoral School, referred to in points 5 and 6, there is an application form to appeal against decision. The application is submitted:
   1) in the case referred to in section 5 – to the Rector,
   2) in the case referred to in para. 6 – to the Director of the PBS Doctoral School,
   within 14 days from the date of delivery of the decision.
8. The appeal procedure against the decisions referred to in point 6 is specified in the Regulations of the PBS Doctoral School.
9. Administrative decisions resulting from the conducted qualification procedure for the Doctoral School shall be delivered to candidates on general terms, subject to point 10.
10. Service of the decision to a candidate who is not domiciled or a habitual resident in the Republic of Poland, if the candidate has not appointed a representative residing in the Republic of Poland to conduct the case, they are obliged to indicate a representative for service in the Republic of Poland. If the representative for service is not indicated, the letters intended for this candidate are sent in the form of a scan to the e-mail address provided in the candidate's application form, and the original is left in the case files with the effect of delivery.
11. Candidates referred to in §1 point 6 admitted to the PBS Doctoral School start education from the beginning of the subsequent semester after the end of the procedure, unless the Director, in justified cases, specifies an earlier date of commencement of education.

## § 8
## SUPPLEMENTARY RECRUITMENT

1. In the event of failure to meet the limit of places, supplementary recruitment may be held.
2. Supplementary recruitment is announced by the Rector at the request of the Committee.
3. The deadlines for accepting documents and the dates for the classification procedure in the supplementary recruitment are determined by the Rector.
4. The provisions of the preceding paragraphs shall apply to supplementary recruitment as regards the procedure for its conduct, the composition of the Committee and the principles of candidate classification.

## § 9
## JOINT RECRUITMENT

1. Candidates may be admitted to the Doctoral School on the basis of a contract concluded between the Bydgoszcz University of Science and Technology and another entity, provided that the doctoral scholarship is fully financed for a period of 4 years from the date of commencement of education at the PBS Doctoral School.
2. The joint recruitment is launched on the basis of the Rector's consent.
3. The entities referred to in point 1 cooperate in the field of joint recruitment, in particular by determining the composition of the Recruitment Committee, the rules for conducting the qualification procedure, the required documents and the procedure and deadlines for submitting admission applications to the PBS Doctoral School.

This document has been drawn up in two language versions – in Polish and in English. The Polish version is valid and shall prevail in case of any discrepancies in the interpretation of the declarations. The English version is for information purposes only.

Annex No. 1
Principles of admitting candidates for the first year of education
to the Doctoral School of Bydgoszcz University of Science and Technology

Date of receipt (filled by Doctoral School Office) .....

# *DOCTORAL SCHOOL ADMISSION APPLICATION*

I kindly request my admission to the Doctoral School of Bydgoszcz University of Science and Technology in the academic year of……. in the discipline of:

**……**

and to the language group in:

- ☐ **POLISH**
- ☐ **ENGLISH**

| **Personal data** | |
|---|---|
| **Surname** | |
| **Given name (names)** | |
| **Date and place of birth** | |
| **Citizenship** | |
| **PESEL number** | |
| **Type and number of identity document in the absence of PESEL number** | |
| **Place of residence** | |
| **Postal code** | |
| **Province** | |
| **Post office** | |
| **City/Town** | |
| **Street name** | |
| **House or apartment no.** | |
| **Contact phone number** | |
| **E-mail address** | |
| **Correspondence address** | |
| **Postal code** | |
| **Province** | |
| **Post office** | |

| | |
|---|---|
| **City/Town** | |
| **Street name** | |
| **House or apartment no.** | |
| **Contact phone number** | |
| **E-mail address** | |

| **Education** | |
|---|---|
| Full name of university completed | |
| Year of university graduation | |
| Name of the field of study | |
| Academic title | |
| Number of graduation document | |

**List of Annexes**

| No. | Document title | Annexed |
|---|---|---|
| 1. | Originals or copies or notarized copies of graduation diplomas with a supplement | YES/ NO |
| 2. | Confirmation of recognition of the foreign diploma in the Republic of Poland by the National Agency for Academic Exchange | YES/ NO |
| 3. | A photo in accordance with the requirements for issuing identity cards in paper and electronic form | YES/ NO |
| 4. | Planned research project | YES/ NO |
| 5. | Initial declaration of the future doctoral dissertation supervisor | YES/ NO |
| 6. | A self-declaration of command of the English language | YES/ NO |
| 7. | Declaration on the source of funding for the doctoral scholarship | YES/ NO |
| 8. | Declaration of support for the entity of the social and economic environment in the implementation of the research project | YES/ NO |
| 9. | Tabular list of scientific articles with journal scores and their copies | YES/ NO |
| 10. | List of certificates of active participation in scientific conferences with their copies | YES/ NO |
| 11. | Tabular list of patents with their copies. | YES/ NO |
| 12. | List of documents confirming financing of participation in research projects obtained through competitions conducted by national and international agencies financing scientific and research and development activities | YES/ NO |
| 13. | A certificate of disability issued by a Provincial Disability Evaluation Board | YES/ NO |

| **Declarations** |
|---|
| I declare that I am/I am not employed* as an academic teacher or researcher. |
| I declare that I have/do not have* a doctoral degree. |
| I declare that I have not been educated in any doctoral school and I have not received a scholarship.*<br>I declare that I was educated at the doctoral school and received a scholarship for ..... months.* |
| I declare I have familiarized myself with the Principles of admitting candidates for the first year of education to the Doctoral School of Bydgoszcz University of Science and Technology. |
| I declare that the data contained in the application are consistent with the facts and the law. I am aware of the criminal liability for testifying untruthfully or concealing the truth. I undertake to notify the Bydgoszcz University of Science and Technology immediately (no later than 5 days from the date of the change) about any change in the above-mentioned data and I accept all responsibility for failure to comply with the above obligation.<br>I consent to the processing and use of my personal data by the Bydgoszcz University of Science and Technology for the purposes of the classification procedure and documenting the course of the education process at the Doctoral School.<br><br>…… ……<br>date candidate's signature |

/*delete where inapplicable

The Controller of your personal data is the Bydgoszcz University of Science and Technology (Al. Prof. Sylwestra Kaliskiego 7, 85-796 Bydgoszcz). The Controller processes personal data in accordance with the Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC. Full information for data subjects is available on the website: https://odo.utp.edu.pl/klauzula-informacyjna-dla-studentow/.

This document has been drawn up in two language versions – in Polish and in English. The Polish version is valid and shall prevail in case of any discrepancies in the interpretation of the declarations. The English version is for information purposes only.

Annex No. 2
Principles of admitting candidates for the first year of education
to the Doctoral School of Bydgoszcz University of Science and Technology

....., date .....

## A. Consent to provide supervision

**Personal data of the supervisor**

Name and surname of the supervisor .....

Academic title…….....

Name of the Faculty/Department/Unit.....

Name and address of the University …….....

**Declaration**

I hereby declare my consent to be designated as a supervisor to
Mr./Mrs. .....

within the discipline of …… at the Doctoral School of Bydgoszcz University of Science and Technology.

I declare that in the last 5 years I have not been/I have been* a supervisor of 4 doctoral students who were removed from the register of doctoral students due to a negative result of mid-term evaluation and I did not hold/I held* supervision over the preparation of the dissertation by at least 2 applicants for the doctoral degree who did not receive positive reviews pursuant to Art. 191 § 1 of the Act of 20 July 2018 – The Law on Higher Education and Science.

.....
*supervisor's signature*

/*delete where inapplicable

....., date .....

## B. Consent to provide additional supervision

**Personal data of the additional supervisor**

Name and surname of the supervisor .....

Academic title…….....

Name of the Faculty/Department/Unit.....

Name and address of the University …….....

**Declaration**

I hereby declare my consent to be designated as additional supervisor to
Mr./Mrs. .....

within the discipline of …… at the Doctoral School of Bydgoszcz University of Science and Technology.

I declare that in the last 5 years I have not been/I have been* a supervisor of 4 doctoral students who were removed from the register of doctoral students due to a negative result of mid-term evaluation and I did not hold/I held* supervision over the preparation of the dissertation by at least 2 applicants for the doctoral degree who did not receive positive reviews pursuant to Art. 191 § 1 of the Act of 20 July 2018 – The Law on Higher Education and Science.

.....
*additional supervisor's signature*

/*delete where inapplicable

....., date .....

## C. Consent to provide assistant supervision

**Personal data of the assistant supervisor**

Name and surname of the supervisor .....

Academic title…….....

Name of the Faculty/Department/Unit.....

Name and address of the University …….....

**Declaration**

I hereby declare my consent to be designated as assistant supervisor to
Mr/Mrs .....

within the discipline of …… at the Doctoral School of Bydgoszcz University of Science and Technology.

.....
*assistant supervisor's sginature*

....., date .....

## D. Declaration of the Head of Scientific Discipline Council

I do not see any obstacles in the appointment of the above candidates for the role of supervisors.

.....
*head of scientific discipline*

These declarations have been drawn up in two language versions – in Polish and in English. The Polish version is valid and shall prevail in case of any discrepancies in the interpretation of the declarations. The English version is for information purposes only.

POLITECHNIKA
BYDGOSKA
im. Jana i Jędrzeja Śniadeckich

**ORDINANCE No. Z.108.2021.2022**

**Rector of the Bydgoszcz University of Science and Technology**

of 18 March 2022

**on the establishment of the schedule of the classification procedure for candidates to the Doctoral School of the Bydgoszcz University of Science and Technology for the academic year 2022/2023**

Pursuant to Article 23(1) and (2)(2) in conjunction with Article 200 of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2022, items 574 and 583) in conjunction with § 1(5) of the Principles of admitting candidates for the first year of education to the Doctoral School of Bydgoszcz University of Science and Technology, introduced by Resolution No. 6/466 of the Senate of the Bydgoszcz University of Science and Technology on 15 December 2021, the following is ordered:

**§ 1.** 1. The following schedule of the classification procedure for candidates to the Doctoral School of the Bydgoszcz University of Science and Technology for the academic year 2022/2023 is established:

1) The submission of a set of documents referred to in § 2 of the Principles of admitting candidates for the first year of education to the Doctoral School of Bydgoszcz University of Science and Technology takes place from August 29, 2022 to September 2, 2022, 2:00 p.m. at the Doctoral School Office;
2) The Admission Committee of the Doctoral School, hereinafter referred to as the "Committee", conducts the classification procedure from 07 to 09 September 2022 and announces the results of the classification procedure on 12 September 2022.

2. The Rector, at the request of the Committee, may, in justified cases, extend the deadline for submitting documents, but not longer than until the day preceding the classification date.

**§ 2.** The admission limits referred to in § 1 section 5 of the Principles of admitting candidates for the first year of education to the Doctoral School of Bydgoszcz University of Science and Technology will be determined by a separate ordinance, by 28 June 2022.

**§ 3.** The ordinance enters into force on the date of signing.

**RECTOR**

Professor Marek ADAMSKI

POLITECHNIKA
BYDGOSKA
im. Jana i Jędrzeja Śniadeckich

# ORDINANCE No. Z.157.2021.2022

**Rector of the Bydgoszcz University of Science and Technology**

of 28 June 2022

**on the admission limits for the first year to the Doctoral School of the Bydgoszcz University of Science and Technology and the establishment of the schedule of the classification procedure for the academic year 2022/2023**

Pursuant to Article 23(1) and (2)(2) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2022, item 547, as amended[1]), the following is ordered:

**§ 1.** The admission limit of candidates to the Doctoral School of the Bydgoszcz University of Science and Technology for the academic year 2022/2023 is a total of 20 places.

**§ 2.** The limit indicated in § 1 applies to candidates referred to in § 1 section 4 of the Principles of admitting candidates for the first year of education to the Doctoral School of Bydgoszcz University of Science and Technology adopted by Senate Resolution No. 6/466 of 15 December 2021.

**§ 3.** 1. The dates of the classification procedure for candidates for the Doctoral School depend on the schedule of consideration of applications for funding of research projects obtained through a competition and financed from external sources.

2. The dates of the first classification procedure of candidates for the Doctoral School for the academic year 2022/2023 are set as follows:

1) submission of a set of documents referred to in § 2 of the Rules for admitting candidates for the first year of education to the Doctoral School of the Bydgoszcz University of Science and Technology takes place from August 29, 2022 to September 2, 2022 until 2:00 p.m. at the Doctoral School Office;
2) The Admission Committee of the Doctoral School conducts the classification procedure from 07 to 09 September 2022 and announces the results of the classification procedure on September 12, 2022.

[1] Amendments to the Act were published in the Journal of Laws of 2022, items 583, 655, 682, 807, 1010, 1079 and 1117.

**§ 4.** The Ordinance No. Z.108.2021.2022 of March 18, 2022 on the establishment of the schedule of the classification procedure for candidates to the Doctoral School of the Bydgoszcz University of Science and Technology for the academic year 2022/2023 is repealed.

**§ 5.** The ordinance enters into force on the date of signing.

**RECTOR**

Professor Marek ADAMSKI

POLITECHNIKA
BYDGOSKA
im. Jana i Jędrzeja Śniadeckich

# ORDINANCE No. Z.135.2022.2023

**Rector of the Bydgoszcz University of Science and Technology**

of 14 June 2023

**on the admission limits for the first year to the Doctoral School of the Bydgoszcz University of Science and Technology and the schedule of the classification procedure for the academic year 2023/2024**

Pursuant to Article 23(1) and (2)(2) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2023, item 742), the following is ordered:

**§ 1.** The limit of admission of candidates to the Doctoral School of Bydgoszcz University of Science and Technology referred to in § 1 section 3 of the Principles of admitting candidates for the first year of education to the Doctoral School of Bydgoszcz University of Science and Technology, adopted by Senate Resolution No. 6/466 of 15 December 2021, hereinafter referred to as the "Principles", for the academic year 2023/2024 is a total of 0 places.

**§ 2.** The admission limit of candidates to the Doctoral School of the Bydgoszcz University of Science and Technology, referred to in § 1 section 4 of the Principles, for the academic year 2023/2024 is within the disciplines:

1) automation, electronics, electrical engineering and space technologies – 2;
2) information and communication technology – 2;
3) civil engineering, geodesy and transport – 4;
4) mechanical engineering – 2;
5) chemical sciences – 2;
6) agriculture and horticulture – 2;
7) animal science and fisheries – 2.

**§ 3.** 1. The dates of the classification procedure for candidates for the Doctoral School depend on the schedule of consideration of applications for funding of research projects obtained through a competition and financed from external sources.

2. The dates of the first classification procedure for candidates to the Doctoral School for the academic year 2023/2024 are set as follows:

1) submission of a complete set of documents referred to in § 2 of the Principles takes place from August 21, 2023 to September 1, 2023 until 2:00 p.m. at the Doctoral School Office,
2) The Doctoral School Admissions Committee conducts the classification procedure from 04 to 05 September 2023 and announces the results of the classification procedure on 08 September 2023.

**§ 4.** The ordinance enters into force on the date of signing.

**RECTOR**

Professor Marek ADAMSKI

POLITECHNIKA
BYDGOSKA
im. Jana i Jędrzeja Śniadeckich

# ORDINANCE No. Z.146.2023.2024

**Rector of the Bydgoszcz University of Science and Technology**

of 10 June 2024

**on the admission limits for the first year to the Doctoral School of the Bydgoszcz University of Science and Technology and the determination of the schedule of the classification procedure for the academic year 2024/2025**

Pursuant to Article 23(1) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2023, item 742, as amended[1)]), the following is ordered:

**§ 1.** The limit of admission of candidates to the Doctoral School of the Bydgoszcz University of Science and Technology, referred to in § 1 section 3 of the Principles of admitting candidates for the first year of education to the Doctoral School of Bydgoszcz University of Science and Technology, adopted by the Senate's Resolution No. 6/466 of 15 December 2021, hereinafter referred to as the "Principles", for the academic year 2024/2025 is a total of 0 places.

**§ 2.** The limit of admission of candidates to the Doctoral School of the Bydgoszcz University of Science and Technology, referred to in § 1 section 4 of the Principles, for the academic year 2024/2025 is within the disciplines:

1) automation, electronics, electrical engineering and space technologies – 0;
2) information and communication technology – 2;
3) chemical engineering – 1;
4) civil engineering, geodesy and transport – 1;
5) mechanical engineering – 1;
6) chemical sciences – 1;
7) management and quality studies – 8;
8) agriculture and horticulture – 3;
9) animal science and fisheries – 1.

[1)] Amendments to the consolidated text of this Act were announced in the Journal of Laws of 2023, items 1088, 1234, 1672, 1872, 2005, of 2024, items 124, 227.

**§ 3.** 1. The dates of the classification procedure for candidates for the Doctoral School depend on the schedule of consideration of applications for funding of research projects obtained through a competition and financed from external sources.

2. The dates of the first classification procedure for candidates to the Doctoral School for the academic year 2024/2025 are set as follows:

1) submission of a complete set of documents referred to in § 2 of the Principles for admitting candidates for the first year of education to the Doctoral School of the Bydgoszcz University of Science and Technology takes place on working days from 19 to 28 August 2024 until 2:00 p.m. at the Doctoral School Office;
2) The Recruitment Committee of the Doctoral School conducts the classification procedure from 02 to 10 September 2024 and announces the results of the classification procedure on 13 September 2024.

**§ 4.** The ordinance enters into force on the date of signing.

**RECTOR**

Professor Marek ADAMSKI

POLITECHNIKA
BYDGOSKA
im. Jana i Jędrzeja Śniadeckich

# ORDINANCE No. Z.114.2024.2025

**Rector of the Bydgoszcz University of Science and Technology**

of 7 May 2025

**on the admission limits for the first year to the Doctoral School of the Bydgoszcz University of Science and Technology and the establishment of the schedule of the classification procedure for the academic year 2025/2026**

Pursuant to Article 23(1) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2024, items 1571, 1871, 1897), the following is ordered:

**§ 1.** The limit of admission of candidates to the Doctoral School of the Bydgoszcz University of Science and Technology, referred to in § 1 section 3 of the Principles of admitting candidates for the first year of education to the Doctoral School of Bydgoszcz University of Science and Technology, adopted by the Senate's Resolution No. 6/466 of 15 December 2021, hereinafter referred to as the "Principles", for the academic year 2025/2026 is a total of 0 places.

**§ 2.** The limit of admission of candidates to the Doctoral School of the Bydgoszcz University of Science and Technology, referred to in § 1 section 4 of the Principles, for the academic year 2025/2026 is within the disciplines:

1) information and communication technology – 2;
2) chemical engineering – 1;
3) civil engineering, geodesy and transport – 2;
4) mechanical engineering – 2;
5) chemical sciences – 2;
6) management and quality stidies – 4;
7) agriculture and horticulture – 2;
8) animal science and fisheries – 1.

**§ 3.** 1. The dates of the classification procedure for candidates for the Doctoral School depend on the schedule of consideration of applications for funding of research projects obtained through a competition and financed from external sources.

2. The dates of the first classification procedure of candidates for the Doctoral School for the academic year 2025/2026 are set as follows:

1) submission of a set of documents referred to in § 2 of the Principles for admitting candidates for the first year of education to the Doctoral School of the Bydgoszcz University of Technology takes place on working days from 18 to 29 August 2025 until 2.30 p.m. at the Doctoral School Office;
2) The Admission Committee of the Doctoral School conducts the classification procedure from 2 to 3 September 2025 and announces the results of the classification procedure on 5 September 2025.

**§ 4.** The ordinance enters into force on the date of signing.

**RECTOR**

Professor Marek ADAMSKI

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

# CRITERION 6

## Reliability of the mid-term evaluation

**Nominations by the director of the Commission for mid-term evaluation of doctoral students and resolutions giving opinions on the Doctoral School Council**

Bydgoszcz, 12.03.2021

SzD.0033.1.2021

Pursuant to Article 202(4) of the Act of 18.07.2018 on Higher Education and Science (i.e. Journal of Laws of 2020, item 85, as amended), § 5(1)(13) and § 17(1) and (2) of the Regulations of the Doctoral School of the Jan and Jędrzej Śniadecki University of Technology and Life Sciences in Bydgoszcz and Resolution No. 1/2021 of 12.03.2021 of the Council of the Doctoral School, I hereby appoint:

**Committee for Mid-Term Evaluation of Doctoral Students of the Doctoral School**
**University of Technology and Life Sciences**
**Jan and Jędrzej Śniadecki in Bydgoszcz**
**in the academic year 2021/2022.**

composed of:

Discipline of Mechanical Engineering

1. Chairman: Prof. Dariusz Skibicki – Director of the Doctoral School
2. Tomasz Machniewicz, PhD, DSc, Eng., Professor (AGH)
3. Prof. Janusz Sempruch (UTP)

Discipline of Chemical Sciences;

1. Chairperson: Prof. Maria Siwek-Gapińska – Deputy Director of the Doctoral School
2. Łukasz Klapiszewski, PhD, DSc, Eng., Prof. PP (PP)
3. Prof. Waldemar Iwanek (WTiICh)

Discipline of Agriculture and Horticulture

1. Chairperson: Prof. Maria Siwek-Gapińska – Deputy Director of the Doctoral School
2. Jerzy Nawracała, PhD, DSc, Associate Professor (UP Poznań)
3. Prof. Janusz Prusiński (WRiB)

Discipline of Animal Science and Fisheries

1. Chairperson: Prof. Maria Siwek-Gapińska – Deputy Director of the Doctoral School
2. Jan Mazurkiewicz, PhD, DSc, Eng., Prof. UPP (UP Poznań)
3. Magdalena Stanek, PhD, DSc, Eng., Professor of the University (WHiBZ)

Director of the Doctoral School

Prof. Dariusz Skibicki

Resolution No. 1/2021
Doctoral School Council
University of Technology and Life Sciences
Jan and Jędrzej Śniadecki in Bydgoszcz
of 12.03.2021

concerning: expressing an opinion on the candidates for the mid-term evaluation committee

Based on:

- Article 202(4) of the Act of 18.07.2018 Law on Higher Education and Science (i.e. Journal of Laws of 2020, item 85, as amended)
- § 6 section 4 point 4 and § 17 sections and 2 of the Regulations of the Doctoral School of the Jan and Jędrzej Śniadecki University of Technology and Life Sciences in Bydgoszcz adopted by resolution No. 1/441 of 15.04.2020 of the Senate of the Jan and Jędrzej Śniadecki University of Technology and Life Sciences in Bydgoszcz

Doctoral School Council
University of Technology and Life Sciences
Jan and Jędrzej Śniadecki in Bydgoszcz
Decides:

1. Give a positive opinion to the composition of the Mid-Term Evaluation Committee, which is to carry out the mid-term evaluation of doctoral students after the fourth semester of the education period by 31.10.2021:

   Discipline of Mechanical Engineering

   1) Chairman: Prof. Dariusz Skibicki – Director of the Doctoral School
   2) Tomasz Machniewicz, PhD, DSc, Eng., Professor (AGH)
   3) Prof. Janusz Sempruch (UTP)

   Discipline of Chemical Sciences;
   1) Chairperson: Prof. Maria Siwek-Gapińska – Deputy Director of the Doctoral School
   2) Łukasz Klapiszewski, PhD, DSc, Eng., Prof. PP (PP)
   3) Prof. Waldemar Iwanek (WTiICh)

   Discipline of Agriculture and Horticulture
   1) Chairperson: Prof. Maria Siwek-Gapińska – Deputy Director of the Doctoral School
   2) Jerzy Nawracała, PhD, DSc, Associate Professor (UP Poznań)
   3) Prof. Janusz Prusiński (WRiB)

   Discipline of Animal Science and Fisheries
   1) Chairperson: Prof. Maria Siwek-Gapińska – Deputy Director of the Doctoral School


Al. prof. S. Kaliskiego 7, 85-796 Bydgoszcztel. 52 374 93 30e-mail:
Szkola.Doktorska@utp.edu.pl

2) Jan Mazurkiewicz, PhD, DSc, Eng., Prof. UPP (UP Poznań)
3) Magdalena Stanek, PhD, DSc, Eng., Professor of the University (WHiBZ)

2. The resolution enters into force on the day of its adoption.

Chairman of the Doctoral School Council
Director of the Doctoral School

Prof. Dariusz Skibicki

Bydgoszcz, 28.03.2022

SzD.436.1.2022

Based on:

- Article 202(4) of the Act of 20.07.2018 Law on Higher Education and Science (Journal of Laws of 2022, item 547, as amended),
- § 5 section 1 point 13 and § 15 sections 1 and 2 of the Regulations of the Doctoral School of the Bydgoszcz University of Science and Technology in Bydgoszcz,
- Resolution of the Doctoral School Council No. 2/2022 of 18.03.2022,

I appoint

**Committee for Mid-Term Evaluation of Doctoral Students**
**in the academic year 2022/2023.**

composed of:

Discipline of Mechanical Engineering

1. Chairman: Prof. Dariusz Skibicki – Director of the Doctoral School
2. Tomasz Machniewicz, PhD, DSc, Eng., Prof. AGH UST
3. Prof. Janusz Sempruch

Discipline Technical Informatics and Telecommunications

1. Chairman: Prof. Dariusz Skibicki – Director of the Doctoral School
2. Piotr Zwierzykowski, PhD, DSc, Eng., Prof. PP
3. Rafał Długosz, PhD, DSc, Eng., Prof. PBŚ

Discipline of Chemical Sciences;

1. Chairperson: Prof. Maria Siwek-Gapińska – Deputy Director of the Doctoral School
2. Aleksandra Radtke, PhD, DSc, Prof. NCU
3. Prof. Oleksander Shyichuk

Discipline of Agriculture and Horticulture

1. Chairperson: Prof. Maria Siwek-Gapińska – Deputy Director of the Doctoral School
2. Prof. Marek Gugała
3. Robert Lamparski, PhD, DSc, Eng., Prof. PBŚ

Discipline of Animal Science and Fisheries

1. Chairperson: Prof. Maria Siwek-Gapińska – Deputy Director of the Doctoral School
2. Marcin Lis, PhD, DSc, Eng., Prof. UR
3. Ewa Grochocka, PhD, DSc, Eng., Prof. PBŚ

**Director of the Doctoral School**

**Prof. Dariusz Skibicki**

**Resolution No. 2/2022**
**Doctoral School Council**
**Bydgoszcz University of Science and Technology**
**of 18.03.2022**

concerning: expressing an opinion on the candidates for the mid-term evaluation committee

Based on:

- Article 202(4) of the Act of 18.07.2018 Law on Higher Education and Science (i.e. Journal of Laws of 2020, item 85, as amended)
- § 6 section 4 point 4 and § 15 section 2 of the Regulations of the Doctoral School of Bydgoszcz University of Science and Technology adopted by resolution No. 2/453 of 20.01.2021 of the Senate of the Bydgoszcz University of Science and Technology

Doctoral School Council
Bydgoszcz University of Science and Technology
Decides:

1. Give a positive opinion on the following candidates to the Mid-Term Evaluation Committee, which is to carry out the mid-term evaluation of doctoral students after the fourth semester of the education period by 31.10.2022:
    1) Prof. Dariusz Skibicki (Doctoral School)
    Jan and Jędrzej Śniadecki University of Technology in Bydgoszcz;
    2) Tomasz Machniewicz, PhD, DSc, Eng. (mechanical engineering)
    AGH University of Science and Technology in Krakow;
    3) Prof. Janusz Sempruch (mechanical engineering)
    Jan and Jędrzej Śniadecki University of Technology in Bydgoszcz;
    4) Piotr Zwierzykowski, PhD, DSc, Eng. (information and communication technology)
    Poznań University of Technology;
    5) Rafał Długosz, PhD, DSc, Eng. (information and communication technology)
    Jan and Jędrzej Śniadecki University of Technology in Bydgoszcz;
    6) Prof. Maria Siwek-Gapińska (Doctoral School)
    Jan and Jędrzej Śniadecki University of Technology in Bydgoszcz;
    7) Aleksandra Radtke, PhD, DSc, Eng. (Chemical Sciences)
    Nicolaus Copernicus University in Toruń;
    8) Prof. Oleksander Shyichuk (Chemical Sciences)
    Jan and Jędrzej Śniadecki University of Technology in Bydgoszcz;
    9) Prof. Marek Gugała (Agriculture and Horticulture)
    University of Natural Sciences and Humanities in Siedlce;
    10) Robert Lamparski, PhD, DSc, Eng. (agriculture and horticulture)

Jan and Jędrzej Śniadecki University of Technology in Bydgoszcz;

11) Marcin Lis, PhD, DSc, Eng. (Animal Science and Fisheries)
Hugo Kołłątaj University of Agriculture in Krakow;
12) Ewa Grochocka, PhD, DSc, Eng. (Animal Science and Fisheries)
Jan and Jędrzej Śniadecki University of Technology in Bydgoszcz;

2. The resolution enters into force on the day of its adoption.

**Chairman of the Doctoral School Council**
**Director of the Doctoral School**

**Prof. Dariusz Skibicki**

Bydgoszcz, 06.10.2022

SzD.436.1.1.2022

Based on:

- Article 202(4) of the Act of 20.07.2018 Law on Higher Education and Science (Journal of Laws of 2022, item 547, as amended),
- § 5 section 1 point 13 and § 15 sections 1 and 2 of the Regulations of the Doctoral School of the Bydgoszcz University of Science and Technology,
- Resolution of the Doctoral School Council No. 4/2022 of 06.10.2022,

composed of

**Committee for Mid-term Evaluation of Doctoral Students**
**in the academic year 2022/2023**

Discipline of Chemical Sciences:
I hereby appoint Prof. Waldemar Iwanek from Bydgoszcz University of Science and Technology in place of Prof. Oleksander Shyichuk from the Bydgoszcz University of Science and Technology in the composition of the Evaluation Committee.

**Director of the Doctoral School**

**Prof. Dariusz Skibicki**

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

**Resolution No. 4/2022**
**Doctoral School Council**
**Bydgoszcz University of Science and Technology**
**of 06.10.2022**

concerning: expressing an opinion on the candidates for the mid-term evaluation committee

Based on:

- Article 202(4) of the Act of 18.07.2018 Law on Higher Education and Science (i.e. Journal of Laws of 2022, item 574, as amended)
- § 6 section 4 point 4 and § 15 section 2 of the Regulations of the Doctoral School of the Bydgoszcz University of Science and Technology adopted by resolution No. 2/453 of 20.01.2021 of the Senate of the Bydgoszcz University of Science and Technology
- proposal of the Chairman of the Scientific Council of the Discipline of Chemical Sciences of 03.10.2022

Doctoral School Council
Bydgoszcz University of Science and Technology
Decides

1. Give a positive opinion on the candidacy of Prof. Waldemar Iwanek (discipline: chemical sciences) from the Bydgoszcz University of Science and Technology in place of Prof. Oleksander Shyichuk (discipline: chemical sciences) from the Bydgoszcz University of Science and Technology as a member of the Committee for Mid-Term Evaluation, which is to carry out the mid-term evaluation of doctoral students after the fourth semester of the education period by 31.10.2022.
2. The resolution enters into force on the day of its adoption.

**Chairman of the Doctoral School Council**
**Director of the Doctoral School**

**Prof. Dariusz Skibicki**

Al. Prof. S. Kaliskiego 7, 85-796 Bydgoszcz
tel. +48 52 374 93 30, fax +48 52 374 93 27
E-mail: szkola.doktorska@pbs.edu.pl

Bydgoszcz, 29.05.2023

SzD.4221.1.1.2023

# V O C A T I O N

Pursuant to § 20 section 4a point 13 of the Statute of the Bydgoszcz University of Science and Technology, introduced by Resolution No. 1/460 of the Senate of the Bydgoszcz University of Science and Technology of 14 July 2021 on amendments to the Statute of the Bydgoszcz University of Science and Technology, in connection with Article 202 section 4 of the Act of 20.07.2018 – Law on Higher Education and Science (Journal of Laws of 2023, item 742), I appoint

**Committee for Mid-Term Evaluation of Doctoral Students in the academic year 2023/2024.**

composed of:

Discipline of Mechanical Engineering

1. Chairman: Prof. Dariusz Skibicki – Director of the Doctoral School;
2. Tomasz Machniewicz, PhD, DSc, Eng., Prof. AGH;
3. Prof. Janusz Sempruch.

Discipline of Civil Engineering, Surveying and Transport

1. Chairman: Prof. Dariusz Skibicki – Director of the Doctoral School;
2. Jadwiga Fangrat, PhD, DSc, Eng., Prof. ITB;
3. Dariusz Bajno, PhD, DSc, Eng., Prof. PBŚ.

Discipline of Agriculture and Horticulture

1. Chairperson: Prof. Maria Siwek-Gapińska – Deputy Director of the Doctoral School;
2. Robert Gruszewski, PhD, DSc, Eng., Prof. UPL;
3. Prof. dr hab. inż. Anna Piotrowska-Długosz.

Discipline of Animal Science and Fisheries

1. Chairman: Prof. Dariusz Skibicki – Director of the Doctoral School / Prof. Maria Siwek-Gapińska – Deputy Director of the Doctoral School;
2. Agnieszka Herosimczyk, PhD, DSc, Eng., Prof. ZUT;
3. Mirosław Banaszak, PhD, DSc, Eng., Prof. PBŚ.

**Director of the Doctoral School**

**Prof. Dariusz Skibicki**

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

**Resolution No. 3/2023**
**Doctoral School Council**
**Bydgoszcz University of Science and Technology**
**of 26.05.2023**

**on the opinion on the candidates for the mid-term evaluation committee**

Pursuant to § 20(6a)(4) of the Statute of the Bydgoszcz University of Science and Technology, introduced by Resolution No. 1/460 of the Senate of the Bydgoszcz University of Science and Technology of 14 July 2021 on amendments to the Statute of the Bydgoszcz University of Science and Technology

Doctoral School Council
Bydgoszcz University of Science and Technology
Decides

§ 1. Give a positive opinion on the following candidates to the Mid-Term Evaluation Committee, which is to carry out the mid-term evaluation of doctoral students after the fourth semester of the education period by 31.10.2023:

1) Prof. Dariusz Skibicki (Doctoral School);
2) Tomasz Machniewicz, PhD, DSc, Eng., Prof. AGH (Mechanical Engineering) – AGH University of Science and Technology in Krakow;
3) Prof. Janusz Sempruch (Mechanical Engineering);
4) Jadwiga Fangrat, PhD, DSc, Eng., Prof. ITB (Civil Engineering, Geodesy and Transport) – Building Research Institute;
5) Dariusz Bajno, PhD, DSc, Eng., Prof. PBŚ (civil engineering, geodesy and transport);
6) Prof. Maria Siwek-Gapińska (Doctoral School);
7) Robert Gruszecki, PhD, DSc, Eng., Prof. UPL (Agriculture and Horticulture) – University of Life Sciences in Lublin;
8) Prof. Anna Piotrowska-Długosz (agriculture and horticulture);
9) Agnieszka Herosimczyk, PhD, DSc, Eng., Prof. WPUT (Animal Science and Fisheries) – West Pomeranian University of Technology in Szczecin;
10) Mirosław Banaszak, PhD, DSc, Eng., Prof. PBŚ (Animal Science and Fisheries).

§ 2. The resolution enters into force on the day of its adoption.

**Chairman of the Doctoral School Council**
**Director of the Doctoral School**

**Prof. Dariusz Skibicki**

Al. Prof. S. Kaliskiego 7, 85-796 Bydgoszcz
tel. +48 52 374 93 30, fax +48 52 374 93 27
E-mail: szkola.doktorska@pbs.edu.pl

Bydgoszcz, 19 January 2024

SzD.4221.1.2.2023

# V O C A T I O N

Pursuant to § 20(4a)(13) of the Statute of the Bydgoszcz University of Science and Technology[1)], in conjunction with Article 202(4) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2023, item 742[2]), I hereby appoint

**The Committee for the Mid-Term Evaluation**

for PhD students in the discipline of Civil Engineering, Geodesy and Transport composed of:

1. Chairman: Prof. Dariusz Skibicki – Director of the Doctoral School;
2. Jadwiga Fangrat, PhD, DSc, Eng., Prof. ITB;
3. Dariusz Bajno, PhD, DSc, Eng., Prof. PBŚ.

The method of conducting the mid-term evaluation, including the tasks of the Commission, is specified in Resolution No. 14/479 of the Senate of the PBŚ of 22 March 2023. on the adoption of Regulations No. 4 of the Doctoral School of the Bydgoszcz University of Science and Technology.

The Committee evaluates doctoral students in the middle of the period of education according to the list prepared by the Director of the Doctoral School.

The Commission shall cease its activities at the end of the appeal process against the results of the evaluation.

**Director of the Doctoral School**

**Prof. Dariusz Skibicki**

[1)] Senate Resolutions No: 1/430 of 26 June 2019, 6/456 of 24 March 2021, 5/459 of 23 June 2021, 1/460 of 14 July 2021 and 16/481 of 24 May 2023.
[2] The changes were published in the Journal of Laws of 2023, items 1088, 1234, 1672, 1872 and 2005.

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

**Resolution No. 2/2024**
**Doctoral School Council**
**Bydgoszcz University of Science and Technology**
**of 19.01.2024**

**on the opinion on the candidates for the mid-term evaluation committee**

Pursuant to § 20 section 6a point 4 of the Statute of the Bydgoszcz University of Science and Technology[1)]

Doctoral School Council
Bydgoszcz University of Science and Technology
Decides

§ 1. Give a positive opinion on the following candidates to the Mid-Term Evaluation Committee, which is to carry out a mid-term evaluation of doctoral students in the mid-term education within the discipline of civil engineering, geodesy and transport:

1) Prof. Dariusz Skibicki (Doctoral School);
4) Jadwiga Fangrat, PhD, DSc, Eng., Prof. ITB (Civil Engineering, Geodesy and Transport) – Building Research Institute;
5) Dariusz Bajno, PhD, DSc, Eng., Prof. PBŚ (Civil engineering, Geodesy and Transport).

§ 2. The resolution enters into force on the day of its adoption.

**Chairman of the Doctoral School Council**
**Director of the Doctoral School**

**Prof. Dariusz Skibicki**

[1)] Senate Resolutions No: 1/430 of 26 June 2019, 6/456 of 24 March 2021, 5/459 of 23 June 2021, 1/460 of 14 July 2021 and 16/481 of 24 May 2023.

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Bydgoszcz, 19 August 2024

SzD.4221.1.1.2024

# V O C A T I O N

Pursuant to § 20(4a)(13) of the Statute of the Bydgoszcz University of Science and Technology[1)], in conjunction with Article 202(4) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2023, item 742[2]), I hereby appoint

**The Committee for the Mid-Term Evaluation**

for PhD students in the discipline of Information and Communication Technology, composed of:

1) Prof. Dariusz Skibicki (Doctoral School, Mechanical Engineering);
2) Prof. Krzysztof Okarma (Information and Communication Technology) – West Pomeranian University of Technology in Szczecin;
3) Tomasz Talaśka, PhD, DSc, Eng., Prof. PBŚ (Information and Communication Technology).

The method of conducting the mid-term evaluation, including the tasks of the Commission, is specified in Resolution No. 14/479 of the Senate of the PBŚ of 22 March 2023. on the adoption of Regulations No. 4 of the Bydgoszcz University of Science and Technology.

The Committee evaluates doctoral students in the middle of the period of education according to the list prepared by the Director of the Doctoral School.

The Commission shall cease its activities at the end of the appeal process against the results of the evaluation.

**Director of the Doctoral School**

**Prof. Dariusz Skibicki**

[1)] Senate Resolutions No. 1/430 of 26 June 2019, 6/456 of 24 March 2021, 5/459 of 23 June 2021, 1/460 of 14 July 2021, 16/481 of 24 May 2023 and 4/486 of 25 October 2023.
[2] The changes were published in the Journal of Laws of 2023, items 1088, 1234, 1672, 1872 and 2005, of 2024, items 124, 227, 1089.

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

**Resolution No. 3/2024**
**Doctoral School Council**
**Bydgoszcz University of Science and Technology**
**of 28.06.2024**

**on the opinion on the candidates for the mid-term evaluation committee**

Pursuant to § 20 section 6a point 4 of the Statute of the Bydgoszcz University of Science and Technology[1)]

Doctoral School Council
Bydgoszcz University of Science and Technology
Decides

§ 1. Give a positive opinion on the following candidates to the Mid-Term Evaluation Committee, which is to carry out the mid-term evaluation of doctoral students in the mid-term education within the discipline of information and communication technology:

1) Prof. Dariusz Skibicki (Doctoral School, Mechanical Engineering);
2) Prof. Krzysztof Okarma (Information and Communication Technology) – West Pomeranian University of Technology in Szczecin;
3) Tomasz Talaśka, PhD, DSc, Eng., Prof. PBŚ (Information and Communication Technology).

§ 2. The resolution enters into force on the day of its adoption.

**Chairman of the Doctoral School Council**
**Director of the Doctoral School**

**Prof. Dariusz Skibicki**

[1)] Senate Resolutions No. 1/430 of 26 June 2019, 6/456 of 24 March 2021, 5/459 of 23 June 2021, 1/460 of 14 July 2021, 16/481 of 24 May 2023 and 4/486 of 25 October 2023.

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Bydgoszcz, 10 July 2025

SzD.4221.1.2025

# V O C A T I O N

Pursuant to § 20(4a)(13) of the Statute of the Bydgoszcz University of Science and Technology[1], in conjunction with Article 202(4) of the Act of 20 July 2018 – Law on Higher Education and Science (Journal of Laws of 2024, item 1571[2]), I hereby appoint

**The Committee for the Mid-Term Evaluation**

for PhD students in the discipline of information and communication technology, composed of:

1) Prof. Dariusz Skibicki (Doctoral School, Mechanical Engineering);
2) Krzysztof Simiński, PhD, DSc, Eng., Prof. of the Silesian University of Technology (Information and Communication Technology) – Silesian University of Technology;
3) Rafał Kozik, PhD, DSc, Eng., Prof. PBŚ (Information and Communication Technology).

The method of conducting the mid-term evaluation, including the tasks of the Commission, is specified in Resolution No. 14/479 of the Senate of the PBŚ of 22 March 2023. on the adoption of the Regulations No. 4 of the Bydgoszcz University of Science and Technology[3].

The Committee evaluates doctoral students in the middle of the period of education according to the list prepared by the Director of the Doctoral School.

The Commission shall cease its activities at the end of the appeal process against the results of the evaluation.

**Director of the Doctoral School**

**Prof. Dariusz Skibicki**

[1] Senate resolutions no.: 1/430 of 26 June 2019, 6/456 of 24 March 2021, 5/459 of 23 June 2021, 1/460 of 14 July 2021, 16/481 of 24 May 2023, 4/486 of 25 October 2023, 6/496 of 25 September 2024 and 10/501 of 22 January 2025.
[2] The changes were published in the Journal of Laws: of 2024, items 1871 and 1897, of 2025, items 619, 620, 621 and 622.
[3] Amendment introduced by Resolution No. 2/496 of the Senate of the PBŚ of 25 September 2024

POLITECHNIKA BYDGOSKA
Szkoła Doktorska

HR EXCELLENCE IN RESEARCH

**Resolution No. 2/2025**
**Doctoral School Council**
**Bydgoszcz University of Science and Technology**
**of 04.07.2025**

**on the opinion on the candidates for the mid-term evaluation committee**

Pursuant to § 20 section 6a point 4 of the Statute of the Bydgoszcz University of Science and Technology[1)]

Doctoral School Council
Bydgoszcz University of Science and Technology
Decides

§ 1. Give a positive opinion on the following candidates to the Mid-Term Evaluation Committee, which is to carry out the mid-term evaluation of doctoral students in the mid-term education within the discipline of Information and Communication Technology:

1) Prof. Dariusz Skibicki (Doctoral School, Mechanical Engineering);
2) Krzysztof Simiński, PhD, DSc, Eng., Prof. of the Bydgoszcz University of Science and Technology (Information and Communication Technology) – Bydgoszcz University of Science and Technology;
3) Rafał Kozik, PhD, DSc, Eng., Prof. PBŚ (Information and Communication Technology).

§ 2. The resolution enters into force on the day of its adoption.

**Chairman of the Doctoral School Council**
**Director of the Doctoral School**

**Prof. Dariusz Skibicki**

[1)] Senate Resolutions No: 1/430 of 26 June 2019, 6/456 of 24 March 2021, 5/459 of 23 June 2021, 1/460 of 14 July 2021, 16/481 of 24 May 2023, 4/486 of 25 October 2023, 6/496 of 25 September 2024 and 10/501 of 22 January 2025.

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POLITECHNIKA BYDGOSKA
Szkoła Doktorska

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# CRITERION 6

## Reliability of the mid-term evaluation

## Excerpts from the Regulations of the Doctoral school on mid-term evaluation

Appendix to the Resolution of the PBS Senate No. 14/479
of March 22, 2023.

POLITECHNIKA BYDGOSKA
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HR EXCELLENCE IN RESEARCH

# REGULATIONS No. 4
# OF THE DOCTORAL SCHOOL

# BYDGOSZCZ UNIVERSITY
# OF SCIENCE AND TECHNOLOGY

Take effect from October 1, 2023

Bydgoszcz 2023

## MODE OF CONDUCTING MID-TERM EVALUATION

### § 1

### Conditions for Carrying Out the Mid-Term Evaluation

1. The mid-term evaluation is carried out after the fourth semester of the education period, no later than October 31.
2. In particularly justified cases, the mid-term evaluation may be carried out using remote communication methods and techniques.
3. By September 30 of the academic year preceding the academic year in which the mid-term evaluation will take place, the doctoral student course to mid-term evaluation is obliged to submit a report on the implementation of the IRP and the opinion of the supervisor or supervisors or the supervisor and assistant supervisor (Appendix No. 1).
4. The doctoral student's implementation of the IRP is subject to mid-term evaluation.
5. The mid-term evaluation ends with a positive or negative result.
6. The evaluation result and justification are public.
7. The University immediately provides information on the mid-term evaluation results and its justification in its website's Public Information Bulletin.
8. The doctoral student may appeal against the mid-term evaluation results to the Head of the Doctoral School.
9. The closing date for submitting an appeal together with justification is 14 (fourteen) days from the date of making the assessment results available.
10. The Head considers the appeals referred to in Point 7 no longer than within 30 (thirty) days from their submission date. The Head's decision is final.

### § 2

### The Mid-Study Evaluation Committee and Its Course

1. The mid-term evaluation is carried out by a committee composed of three persons, including at least one person holding a habilitation degree or the title of professor in the discipline in which the doctoral dissertation is being prepared, employed outside the entity running the Doctoral School or a person referred to in Article 190, Paragraph 5.
2. The Committee is apppointed by the Head from among the candidates indicated by the Scientific Councils of the disciplines after obtaining an opinion from the Council.
3. The supervisor and assistant supervisor cannot be members of the Committee.
4. The work of the Committee consists of the following parts:
   1) discussion of the doctoral student's report on the implementation of the IRP;
   2) discussion of the opinion of the supervisor or supervisors on the level of advancement of the IRP implementation;
   3) the doctoral student submits a report on the implementation of the IRP;
   4) discussion during which the doctoral student is asked questions;
   5) determining the result of the mid-term evaluation in an open vote by a simple majority of votes.
5. Parts 1, 2 and 5 are conducted without the participation of the doctoral student.
6. A doctoral student's presentation of the report shall not be longer than 15 minutes.
7. The opinion referred to in Paragraph 4, Point 2 should include an assessment of the level of advancement of the IRP implementation of the doctoral student course to mid-term

evaluation, an assessment of the quality of cooperation with the doctoral student and forecasts as to the completion date of the dissertation.

8. Minutes of the Committee's work are drawn up, constituting Appendix No. 7 to the Regulations.
9. After the results are announced, the document referred to in Paragraph 8 is forwarded to the doctoral student and the supervisor.

POLITECHNIKA BYDGOSKA
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HR EXCELLENCE IN RESEARCH

# CRITERION 6

## Reliability of the mid-term evaluation

# Training materials for members of the Committee on mid-term evaluation

POLITECHNIKA
BYDGOSKA
im. Jana i Jędrzeja Śniadeckich

# Meeting of the members of the Mid-Term Evaluation Committee

9.10.2024

Art. 202.

2. The implementation of the plan is subject to a mid-term evaluation in the middle of the period of education specified in the curriculum.

3. The mid-term evaluation shall end with a positive or negative result. The result of the assessment and the justification shall be public.

4. The mid-term evaluation is carried out by a committee consisting of 3 persons, including at least 1 person holding the degree of habilitated doctor or the title of professor in the discipline in which the doctoral dissertation is being prepared, employed outside the entity running the doctoral school or a person referred to in Article 190(5). The supervisor and the assistant supervisor cannot be members of the committee.

5. A person who is a member of the committee, employed outside the entity running the doctoral school, is entitled to remuneration in the amount of 20% of the professor's salary.

## HOW THE MID-TERM EVALUATION IS CARRIED OUT

§ 16. Conditions for the mid-term evaluation

§ 17. The Committee on Mid-Term Evaluation and its course

In accordance with the provisions of the Regulations of the Doctoral School § 17

Paragraph 4. The mid-term evaluation shall take place before the Commission. During the meeting of the Commission, the following shall take place:

1) discussion of the doctoral student's report on the implementation of IPB;

2) discussing the supervisor's or supervisors' opinions on the degree of advancement of IPB implementation;

3) presentation by the doctoral student of a self-report on the implementation of IPB;

4) a discussion during which the doctoral student is asked questions;

5) determining the result of the mid-term evaluation in an open vote by a simple majority of votes.

Section 5. Parts 1, 2 and 5 are conducted without the participation of a PhD student.

Documents at the disposal of the Commission:

1. Individual Research Plan with a report;
2. Supervisor's opinion;
3. Presentation of the PhD student;
4. Commission Minutes.

Tips for members of the Committee:

1. It should be examined whether all the tasks envisaged in the IPB for the period of the first and second year have been completed?
2. If the sentence has not been implemented in its entirety, should it be specified in what part it was executed?
3. If the task has not been completed or partially completed, it is necessary to determine what are the reasons for not completing the task and whether they are independent of the doctoral student?
4. If the task has not been completed or partially implemented, it is necessary to determine whether remedial measures have been taken, a recovery plan?
5. Does the task that has not been completed or partially completed have a chance to be implemented, or should the IPB possibly be changed?

Tips for members of the Committee:

6. It should be investigated whether the IPB contains at least one task from the list of mandatory tasks. If not, the PhD student should be obliged to change the IPB in the proposals.
7. It should be examined whether there are documents confirming the performance of mandatory tasks: for publication – confirmation of publication of the article containing at least the DOI number; for conference presentations – the conference plan from the organizer's materials; for grant applications – confirmation from the granting institution; for a research internship or study visit – a report on the trip confirmed by the host party.
8. The supervisor's opinion is of an auxiliary nature. However, if this opinion does not comply with the IPB report, the doctoral student should be asked to clarify them.

## Tips for members of the Commission:

9. I kindly ask you to read the practical savoir-vivre guide for people with disabilities:

https://pbs.edu.pl/pl/pracownik/materialy-dotyczace-ksztalcenia-osob-z-niepelnosprawnosciami/poradnik-savoir-vivre

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NATIONAL INFORMATION PROCESSING INSTITUTE

Minister of Science and Higher Education
Republic of Poland

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