Wrocław University of Science and Technology

Study programme

Organizational unit:	Faculty of Management
Field of study:	Business Engineering
Level of study:	second degree 3 semesters
Form of study:	full-time studies
Education cycle:	2025/2026

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Field of study characteristics

Basic information

Organizational unit:	Faculty of Management
Field of study:	Business Engineering
Study level:	second degree 3 semesters
Study form:	full-time studies
Education profile:	general academic profile
Language of study:	English
Valid from the education cycle:	2025/2026
Number of semesters:	3
Total number of hours of classes:	directional: 810 Business Intelligence: 270
Total number of ECTS points required to complete a given level of study:	90
Professional title awarded to graduates:	magister inżynier

Fields of science and scientific disciplines

Scientific disciplines to which the field of study is assigned:

Field of the social sciences, Field engineering and technical sciences

Assigning the major to the fields and disciplines to which the learning outcomes relate:

Discipline	Percentage
Management science and quality	66%
Technical computing and telecommunications	34%

Main discipline: Management science and quality

Description of the field, profile of the graduate and possibilities of continuing studies

Prerequisites: Graduate at least of first-level studies (bachelor of engineering); upon completion of studies graduate obtains professional degree of: Master of Science. Graduate profile, employability:

Description

Responding to the needs of the market, the studies combine managerial competences with the improvement of IT skills. In both specializations, students will improve their skills in analyzing data from the market environment of enterprises, predictive analysis, algorithmic business thinking, cloud services for business, business psychology, digital marketing as well as project and business management. The best students will be able to conduct research with our scientists with the prospect of working in an academic environment.

At the second degree of Business Engineering (BE), students can deepen their acquired knowledge and extend it by choosing one of two specializations: English-language specialization (Business Intelligence, BI) focused on aspects related to business analytics or Polish-language specialization (Project Management, ZPR) oriented on the management of various types of projects (business, IT, social,

public, scientific, etc.).

Business Intelligence (BI) is designed to provide students with cutting edge business knowledge and a strong foundation in both analytics – including computational statistics and machine learning – and core business areas, building a solid platform for a successful career. This specialization focuses on how to analyze data in order to identify and predict patterns and on how to visualize and present results to support managerial decisions and lead to innovative thinking in today's organizations.

Acquired skills and competences

Students will learn how to: Use data analytics to stimulate business growth with newly discovered quantitative and qualitative skills; Stay on top of the latest methods and approaches in computational statistics and machine learning; Use cutting-edge techniques to immerse in case studies and apply new approaches to own data challenges; Use visualization software to identify trends, explore hypotheses, challenge assumptions, and create a more detailed, data-driven understanding of business activities; Conduct top-tier research and report the results to managers, peers and the public; Simulate realistic future paths of all kinds of business processes; Predict outcomes to enable making informed business decisions and developing winning strategies; Reach the right customers with the right products and communications;Leverage the power of data to make informed business decisions and thrive in a rapidly changing environment.

Career

The demand for business analytics is high. Graduates who complete the Business Intelligence program in Business engineering will acquire computational skills and management expertise that the business world is actively seeking. Our program prepares students for data-driven decision support that is crucial for today's business activities across a broad range of industries including ICT, financial, energy and healthcare. The BE curriculum provides the skills to fill positions not only as business intelligence analysts, but also data analysts and consultants, revenue optimization analysts, risk managers, market analysts and many more. Given that the students will have the opportunity to conduct research with affiliated faculty and senior staff, the program also prepares for careers in Academia.

Possibility of continuing studies: doctoral school, postgraduate (post diploma) studies.

Currentness of the study programme

Concept and goals of education

The concept and objectives of education in the field of Business Engineering take into account the compliance of the study program with the scientific activity of employees. The field of study Business Engineering is interdisciplinary. It integrates engineering skills with the knowledge, skills and competencies management and quality sciences. The curriculum meets the requirements of the in accordance with the applicable law and is consistent with the National Education Framework in the field of engineering and technical sciences and social sciences. The concept of education includes first- and second-level studies with a general academic profile, which are conducted in a full-time mode in Polish and English language. The first-level studies have one specialization: Applications of IT in Business (ZIB) in Polish, Second-level studies, on the other hand, have two specializations: Project Management (ZPR) in Polish; Business Intelligence (BI) in English. The aim of education in the field of Business Engineering in general is to integrate knowledge, skills and social competences management and quality sciences with engineering skills corresponding to the discipline of technical informatics and telecommunications with the use of elements of applied mathematics.

Information regarding the inclusion of socio-economic needs in the study programme and the compliance of the major learning outcomes with these needs

The assumed learning outcomes correspond to the requirements set by employers for employees/ graduates on the labor market, in particular in the field of: solving decision problems with the use of advanced data analysis methods, optimization and simulation methods with the use of professional IT systems; identifying and analyzing the needs of IT system users, managing the implementation of these systems and testing their usability; building a project portfolio and managing it in accordance with the goals of the organization; identifying, at the level of the entire organization, the real needs of individual business domains, in connection with the overall strategy of the organization, identifying and delivering the expected value to customers by managing relationships with them focused on achieving the goals of the organization.

Learning outcomes meet the demand for specialists/ managers prepared for data-driven decision support that is crucial for today's business activities across a broad range of industries including ICT, financial, energy and healthcare. The BI curriculum provides the

skills to fill positions not only as business intelligence analysts, but also data analysts and consultants, revenue optimization analysts, risk managers, market analysts and many more. BE graduates are capable of integrating engineering knowledge and skills in the field of management and quality sciences in relation to solving complex substantive and managerial problems. The competences obtained in the classes of education will enable the graduate to effectively carry out tasks in individual areas of the organization's activities, in particular in the field of: decision optimization; flexibility and risk management; supporting managerial decisions; information systems management.

The program of studies in the field of Business Engineering at the second-cycle studies and many years of experience of the teaching staff create conditions for the graduates to achieve the assumed learning outcomes and meet the above requirements formulated by employers.

he main source of changes in the study program is to follow current scientific trends in the two disciplines to which the major is assigned, as well as changes in the business and economic environment. On an ongoing basis, consultations are held with the Faculty Social Council and the fate of graduates is analysed on the basis of publicly available databases (e.g. ELA) and reports on the labour market.

Additional factors determining the timeliness of the program are consultations with the Student Council, as well as the results of student surveys and conclusions of post-sessional meetings, as a result of which changes are made in the content, from or hourly dimension of individual subjects.

Other important factors determining the validity of the study programme

Not applicable.

The connection of the programme with the University's mission and its development strategy

Business engineering graduates acquire business, analytical, social and technical competences. The educational program in Business engineering is coherent with the mission of Wrocław University of Science and Technology in the following areas: Developing the professionalism and hard skills of graduates in business data analysis and project management that determine the functioning of the TechnoSphere; Aiming to provide high quality classes and providing the students of Business engineering and lecturers with conditions enabling open discussion and constructive criticism; Developing the values and tradition of higher education, wide-ranging cooperation with other universities all over the world via students taking part in scientific conferences and the Erasmus program, and with employers via practical learning, carried out in the form of projects in specific organizations; Developing creative, critical and tolerant graduates, as studying a classes in Business engineering emphasizes on appropriate skills and attitudes development; Striving to obtain a worthy place in the field of training specialists in the field of management among domestic and foreign universities.

The Faculty's development plan is in line with the University's strategy. In particular, the Faculty "... combines theoretical, research and expert competences with didactic and educational competences. The Faculty is a leading research and teaching center in Poland and a significant center on an international scale. The didactic and scientific-research profile as well as the quality of education and research in economic and technical sciences ensure it a suitable place in national and international rankings". Conducting Business engineering studies is a permanent element of the Faculty's development strategy. In line with the principle adopted at Wrocław University of Science and Technology, studies in the field of Business engineering have a general academic profile. The study curriculum meets all the requirements resulting from applicable law, including the Polish Qualifications Framework and the characteristics of obtaining engineering competences. In line with the University's strategy, in order to increase the attractiveness of studies on the educational market, the MSc studies education program is unique in that it uses the natural - in economic practice - complementarity of technical and economic education, enriched with an IT module. In accordance with the University's strategy and the Faculty's development plan, which indicate the need for links with the region and the economy, conditions are created and systematic contacts between students and enterprises and other institutions are forced in the didactic process.

In line with the University's development strategy, the quality of education is systematically improved. This is achieved thanks to the scientific development of employees and the increase in their teaching competences, as well as thanks to the systematic enrichment of the Faculty's infrastructure, including the modernization of the rooms as well as teaching and laboratory aids.

At the second degree of studies in the field of Business engineering, the study curriculum includes a set of learning outcomes and the corresponding substantive content of education, enabling graduates to effectively compete on the labor market. Students are prepared to continue their third-cycle studies at the Doctoral School and to conduct their own research. Graduates are also aware of the need to

constantly act for their own professional development in cooperation with their home university.

Learning outcomes

Code	Description of the directional learning outcome	Characteristics for qualifications at level 6 or 7 of the Polish Qualifications Framework	Characteristics for qualifications at level 6 or 7 of the Polish Qualifications Framework, enabling the acquisition of engineering competences
Knowledge			
K2_IZ_W01	The graduate has in-depth knowledge of IT models, methods and tools, especially simulation tools for solving management decision-making problems.	P7S_WG, P7S_WK	
K2_IZ_W02	The graduate has in-depth knowledge of methods and IT tools for the preparation of data, from a variety of sources, necessary for business decision-making.	P7S_WG, P7S_WK	
K2_IZ_W03	The graduate has in-depth knowledge of the technology, key functions and applications of business support IT solutions.	P7S_WG, P7S_WK	
K2_IZ_W04	The graduate has in-depth knowledge of theoretical methods (mathematical, econometric, statistical, forecasting) used to support decision-making processes, including the explanation of complex relationships between phenomena in these processes in the field of management.	P7S_WG	P7S_WG_INŻ
K2_IZ_W05	The graduate has in-depth knowledge of professional IT packages for statistical and econometric modelling and analysis to support the solution of decision-making problems in management processes.	P7S_WG	P7S_WG_INŻ
K2_IZ_W06	The graduate has in-depth knowledge of inter-organisational relations and the interaction of organisations with the environment in the context of national, international and intercultural conditions. They can explain and illustrate the impact of the interaction of the environment on the organisation’s activities.	P7S_WK	
K2_IZ_W07	The graduate has in-depth knowledge of the organisation and functioning of a business in the fields of strategic management, logistics, marketing, finance, business architecture and protection of intellectual and industrial property. They know and understand the main development trends in the discipline of management and quality studies.	P7S_WG, P7S_WK	
K2_IZ_W08	The graduate has in-depth knowledge of the technical means and IT systems of communication in organisations (including their life-cycle processes) and knows the characteristics of an efficient communication process.	P7S_WG	P7S_WG_INŻ
K2_IZ_W09	The graduate has in-depth knowledge of methods and techniques for diagnosing and improving activities in specific functional areas of an organisation and selected methods for studying the business environment.	P7S_WG	P7S_WG_INŻ
K2_IZ_W10	The graduate has in-depth knowledge of risk, its sources and the necessity of its mitigation in the functioning of enterprises. They know the principles of risk management and measurement, and methods of its estimation and mitigation.	P7S_WG	
K2_IZ_W11	The graduate has in-depth knowledge of the interactions taking place in selected physical systems between their individual components and the people (employees) functioning within them.	P7S_WK	P7S_WG_INŻ
K2_IZ_W12	The graduate has in-depth knowledge of the social mechanisms of decision-making and leadership in organisations.	P7S_WG	

Code	Description of the directional learning outcome	Characteristics for qualifications at level 6 or 7 of the Polish Qualifications Framework	Characteristics for qualifications at level 6 or 7 of the Polish Qualifications Framework, enabling the acquisition of engineering competences
K2_IZ_W13	The graduate knows and understands the norms and standards (economic, legal, organisational, ethical, humanistic and other) that condition the context in which the economy and organisations function. They know and understand the fundamental dilemmas of modern civilisation.	P7S_WK	
K2_IZ_W14	The graduate has in-depth knowledge of the theories, methods and instruments of economic and legal policy applied to the regulation of the economy.	P7S_WG	
K2_IZ_W15	The graduate has in-depth knowledge of project and portfolio management at all stages of project implementation, in particular they are familiar with agile methodologies and mathematical and IT tools.	P7S_WG, P7S_WK	P7S_WG_INŻ, P7S_WK_INŻ
K2_IZ_W16	The graduate has in-depth knowledge of how teams are built and function and the factors that influence their performance.	P7S_WG	
K2_IZ_W17	The graduate knows and understands the principles of formation and development of various forms of individual entrepreneurship.	P7S_WK	P7S_WK_INŻ
Skills			
K2_IZ_U01	The graduate is able to select IT methods and tools, in particular simulation tools, for the construction of models of management decision-making problems, and to perform experiments to evaluate the effects of decision options, also taken for unpredictable conditions.	P7S_UW	P7S_UW_INŻ
K2_IZ_U02	The graduate is able, using IT tools, to search, combine, organise and present data for business decision-making.	P7S_UW	P7S_UW_INŻ
K2_IZ_U03	The graduate is able, using IT tools, to analyse the requirements of available technologies and plan the use of IT solutions to support business.	P7S_UW	P7S_UW_INŻ
K2_IZ_U04	The graduate is able, when participating in business decision-making processes, to plan and carry out experiments and, by means of measurements and computer simulations, to interpret the results obtained and draw conclusions.	P7S_UW	P7S_UW_INŻ
K2_IZ_U05	The graduate is able to use analytical, simulation and experimental methods in the identification and formulation of specifications of engineering tasks and their solution.	P7S_UW	P7S_UW_INŻ
K2_IZ_U06	The graduate is able to critically analyse the way in which existing management IT tools function and evaluate these solutions and – according to a given specification – design and implement typical management IT tools, using appropriate methods, techniques, technologies and tools.	P7S_UW	P7S_UW_INŻ
K2_IZ_U07	The graduate is able to use their knowledge to select the sources and information necessary to build complex models of decision-making processes and to analyse this information critically and synthetically.	P7S_UW	P7S_UW_INŻ
K2_IZ_U08	The graduate is able to use their knowledge to formulate and test research hypotheses verifying the usefulness of methods and models to support decision-making processes in the field of management.	P7S_UW	P7S_UW_INŻ
K2_IZ_U09	The graduate is able to use their knowledge of professional IT packages for statistical modelling and analysis to solve decision-making problems in the field of management.	P7S_UW	P7S_UW_INŻ

Code	Description of the directional learning outcome	Characteristics for qualifications at level 6 or 7 of the Polish Qualifications Framework	Characteristics for qualifications at level 6 or 7 of the Polish Qualifications Framework, enabling the acquisition of engineering competences
K2_IZ_U10	The graduate is able to use a foreign language at the CEFR level B2+ and specialist terminology.	P7S_UK	
K2_IZ_U11	The graduate can analyse the causes and dynamics of phenomena in the organisation’s environment under conditions of the market economy and applicable economic and legal regulations.	P7S_UW, P7S_UK	
K2_IZ_U12	The graduate is able to analyse and evaluate objectives, features, elements, processes, functional areas in an enterprise, as well as internal and inter-organisational relationships, applying concepts and theoretical approaches from the social sciences, in particular the discipline of management and quality studies.	P7S_UW, P7S_UK	
K2_IZ_U13	The graduate is able, using adequate methods and tools, to design systems and processes in logistics, corporate strategy, business architecture, communication management and in projects. The graduate is able to make a preliminary economic assessment of proposed solutions.	P7S_UW, P7S_UK	P7S_UW_INŻ
K2_IZ_U14	The graduate is able to formulate innovative alternative solutions to managerial and content-related problems in the enterprise. The graduate is able to substantiate, select and verify them according to the established priorities. The graduate is able to plan actions aimed at solving problems.	P7S_UW, P7S_UK	P7S_UW_INŻ
K2_IZ_U15	The graduate is able to identify risk factors and assess their impact on the course and results of the process and propose preventive actions.	P7S_UW, P7S_UK	P7S_UW_INŻ
K2_IZ_U16	The graduate is able to plan a course of measurement and evaluation of parameters of selected physical systems, also taking into account the human factor.	P7S_UW	P7S_UW_INŻ
K2_IZ_U17	The graduate is able to describe selected issues encountered in everyday and professional life using mathematical and physical formalisms and draw conclusions.	P7S_UW	P7S_UW_INŻ
K2_IZ_U18	The graduate is able to solve problems in communicating with diverse audiences in team-based forms of work organisation. The graduate is able to conduct a debate.	P7S_UK	
K2_IZ_U19	The graduate is able to identify behavioural factors and methods influencing team leadership, decision-making and assuming leadership roles in an organisation. The graduate is able to plan and implement their own lifelong learning and guide others in doing so.	P7S_UO, P7S_UU	
K2_IZ_U20	The graduate is able to use their knowledge to analyse economic phenomena and solve economic problems as well as adapt, substantiate and apply relevant norms and standards (economic, legal, social, humanistic) in specific actions in an organisation.	P7S_UW	
K2_IZ_U21	The graduate is able to apply their knowledge to identify the potential effects of introduced economic and legal regulations on enterprises.	P7S_UW	
K2_IZ_U22	The graduate has developed research skills: formulates hypotheses and research problems, selects appropriate methods, techniques and research tools, develops, presents and interprets research results, draws conclusions, indicates directions for further research in management and quality studies, information and communication technology.	P7S_UW, P7S_UU	P7S_UW_INŻ

Code	Description of the directional learning outcome	Characteristics for qualifications at level 6 or 7 of the Polish Qualifications Framework	Characteristics for qualifications at level 6 or 7 of the Polish Qualifications Framework, enabling the acquisition of engineering competences
K2_IZ_U23	The graduate is able to identify – at an advanced level – complex and untypical managerial and content-related problems in projects implemented in the form of a project.	P7S_UW, P7S_UK	P7S_UW_INŻ
Social competence			
K2_IZ_K01	The graduate is ready to take action to develop the professional accomplishments, uphold the ethos of the profession, and observe professional ethics.	P7S_KR	
K2_IZ_K02	The graduate is able to interact and work in group and team forms of work organisation (taking various roles in them).	P7S_KO, P7S_KR	
K2_IZ_K03	The graduate is ready to flexibly seek and select methods and tools to solve problems arising in the workplace.	P7S_KK	
K2_IZ_K04	The graduate is ready to lead and take responsibility for a group, organise and direct their own and others' work, taking into account changing individual, team and organisational needs.	P7S_KO, P7S_KR	
K2_IZ_K05	The graduate is ready to critically evaluate and solve problems (recognising the importance of knowledge and expert opinion) concerning decision-making and leadership in a group and organisation, taking into account the fulfilment of social obligations, initiating actions for the public interest and the social environment, and thinking and acting in an entrepreneurial manner.	P7S_KK, P7S_KO	
K2_IZ_K06	The graduate is aware of the need for an independent, critical assessment of the scope and level of their professional knowledge and skills, both in the field of management and quality studies, information and communication technology, as well as in the interdisciplinary dimension. The graduate is prepared to independently search for areas of knowledge to supplement and skills to improve.	P7S_KK, P7S_KO, P7S_KR	
K2_IZ_K07	The graduate is prepared to behave in a professional and ethical manner. The graduate recognises and formulates ethical dilemmas related to their own and others' work. They seek appropriate solutions and opportunities to correct inadequacies in their attitudes and behaviours in the workplace and in life.	P7S_KK, P7S_KO, P7S_KR	
Language outcomes			
SJO_S2_U01	Be able to use a foreign language at B2+ ESCJ level and specialised terminology	P7S_UK	

Detailed information on ECTS points

Business Engineering

Name	Business Intelligence
Total ECTS	90
Total number of hours of classes	1080
Number of ECTS points assigned to classes related to scientific activities conducted at the university in the discipline or disciplines to which the field of study is assigned (DN)	73/90 (81.11%)
Number of ECTS points allocated to classes developing practical skills (including laboratory, project) (P)	54.2
The number of ECTS points that a student will receive by completing classes that require the direct participation of academic teachers or other persons conducting classes and students (BU)	45.5
Percentage of ECTS for elective courses	43/90 (47.78%)
The number of ECTS points that a student will receive by completing classes in the humanities or social sciences appropriate for a given field of study	5
The number of ECTS points that a student will receive by completing classes in basic sciences (mathematics, physics/chemistry)	8

Organization of studies

Implementation of the study programme

Allowable ECTS deficit

Semester	Allowable deficit of ECTS points after a semester
Semester 1	8
Semester 2	15
Semester 3	0

Detailed requirements

Not applicable.

Methods of verifying the intended learning outcomes

Activity form	Methods of verifying the intended learning outcomes
Seminar	Multimedia presentations conducted and prepared individually or in groups; case study analysis, class participation, paper
Classes	Credit - oral, written; short test, input task, evaluation of the sub-tasks; practical exam, model, essay, paper
Project	Project preparation, project implementation, project documentation, case study analysis, model
Laboratory	Preparation of laboratory reports; oral statements, class participation; short test, input task, evaluation of the sub-tasks
Lecture	Exam - oral, written, credit, test - oral, written

Description of the process leading to achieving learning outcomes

The process leading to the achievement of the learning outcomes includes active participation in classes organized at the university: lectures, classes, laboratories, projects and seminars, as well as independent studies allowing for consolidation, supplementation and extension of knowledge. If necessary, the student can take advantage of individual consultations. The achievement of learning autcomes can be further supported by participation in study societies/clubs and through optional participation in student organizations.

Internships

Not applicable.

Diploma exam

The diploma examination is an oral exam that assesses the knowledge and skills acquired by the student during their studies in a given field of specialization, carried out in accordance with the study program. During the exam, the student is asked three questions selected randomly from three thematic areas:

1. Creative thinking methods; Real world applications of design thinking.

2. The concept of simulation; Simulation methods in management.

3. Linear and nonlinear relatioship between variables.

4. Descriptive analytics - data visualization tools.

5. Predictive analytics tools and models.

6. Business cycle and market structures.

7. New business models.

8. Leadership and decision making in knowledge based economy.

9. SEO techniques.

10. Social media marketing: content, branding and Public Relations (PR).

11. Risk and uncertainty modeling.

12. Cooperative and non-cooperative games.

13. Regression; Neural networks.

14. Point and probabilistic forecasts.

15. Statistical methods and algorithms used in visual analytics to support business decisions.

16. Methods of web scraping.

17. Effective project implementation: time management, stakeholder coordination and metrics.

18. Cloud services for business - applications, advantages, disadvantages and security.

19. Decision making: methods to evaluate alternatives, efficiency assesment, building composite indicators.

The list of exam questions applicable for a given year is updated as needed, approved by the Program Committee, and published on the Faculty's website. The questions asked during the exam do not go beyond the material covered in the courses completed by the student during their studies.

Study plan

Business Engineering

Semester 1

Student choose one language subject from general offer.

Subject	Number of hours	Form of verification	ECTS points	Mandatoriness
Creative and Design Thinking Workshop	Seminar: 30		2	Obligatory
Physics of Complex Systems	Lecture: 15 Laboratory: 15	Graded credit	3	Obligatory
Business Simulations	Lecture: 15 Laboratory: 30	Graded credit	4	Obligatory
Business Simulations Project	Project: 15	Graded credit	2	Obligatory
Descriptive Analytics	Lecture: 30 Laboratory: 30	Lecture: Exam Laboratory: Graded credit	Lecture: 3 Laboratory: 2	Obligatory
Contemporary Economics	Lecture: 15 Project: 15	Graded credit	2	Obligatory
Contemporary Management	Lecture: 30 Seminar: 30	Lecture: Graded credit Seminar: Graded credit	Lecture: 2 Seminar: 2	Obligatory
Foreign Language 2.1	Classes: 30	Graded credit	2	Obligatory group
The student chooses classes from the offer of the Department of Foreign Languages				
Foreign Language 2.1	Classes: 30	Graded credit	2	Elective
AI in Management	Project: 15	Graded credit	1	Obligatory
Sum	**315**		**25**	

Specialty: Business Intelligence

Subject	Number of hours	Form of verification	ECTS points	Mandatoriness
Business Intelligence Workplace	Lecture: 15 Laboratory: 30 Project: 15	Graded credit	5	Obligatory in specialty
Sum	**60**		**5**	

Semester 2

Subject	Number of hours	Form of verification	ECTS points	Mandatoriness
Digital Marketing and Social Media	Lecture: 15 Laboratory: 30	Graded credit	3	Obligatory
Creative and Design Thinking Project	Project: 15	Graded credit	1	Obligatory
Games and Decisions in Management	Lecture: 30 Laboratory: 30	Lecture: Graded credit Laboratory: Graded credit	Lecture: 2 Laboratory: 2	Obligatory
Project Management	Lecture: 15 Laboratory: 30 Project: 15	Lecture: Exam Laboratory: Graded credit Project: Graded credit	Lecture: 2 Laboratory: 2 Project: 2	Obligatory
Business Anthropology	Lecture: 15	Graded credit	1	Obligatory
Diploma Seminar	Seminar: 15	Graded credit	1	Obligatory elective
Managerial Accounting for Engineers	Lecture: 15 Classes: 15 Laboratory: 15	Lecture: Graded credit Classes: Graded credit Laboratory: Graded credit	Lecture: 1 Classes: 1 Laboratory: 1	Obligatory
Sum	**255**		**19**	

Specialty: Business Intelligence

Subject	Number of hours	Form of verification	ECTS points	Mandatoriness
Predictive Analytics	Lecture: 30 Laboratory: 30	Lecture: Laboratory:	Lecture: 3 Laboratory: 2	Obligatory in specialty

Subject	Number of hours	Form of verification	ECTS points	Mandatoriness
Visual Analytics	Lecture: 15 Laboratory: 15	Graded credit	2	Obligatory in specialty
Web Scraping and Analysis	Lecture: 30 Laboratory: 15	Lecture: Laboratory:	Lecture: 2 Laboratory: 1	Obligatory in specialty
BI Day	Seminar: 15	Graded credit	1	Obligatory in specialty
Sum	**150**		**11**	

Semester 3

Student choose one language subject from general offer.

Student choose one subject from humanities block.

From business module the student choose one subject.

Subject	Number of hours	Form of verification	ECTS points	Mandatoriness
Cloud Computing Services	Laboratory: 15 Seminar: 15	Graded credit	3	Obligatory
Research Workshop	Seminar: 15	Graded credit	1	Obligatory
Diploma Thesis	Project: 45	Graded credit	12	Obligatory elective
Foreign Language 2.2	Classes: 60	Graded credit	3	Obligatory group
The student chooses classes from the offer of the Department of Foreign Languages				
Foreign Language 2.2	Classes: 60	Graded credit	3	Elective
Business Ethics and Intellectual Property	Seminar: 30	Graded credit	2	Obligatory
Business Module	Lecture: 15 Total practical contact hours: 15	Graded credit	2	Obligatory group
The student chooses one subject				
Business Planning	Lecture: 15 Project: 15	Graded credit	2	Elective

Subject	Number of hours	Form of verification	ECTS points	Mandatoriness
Business Models in Developing Environment	Lecture: 15 Project: 15	Graded credit	2	Elective
Business Psychology	Seminar: 30	Graded credit	2	Elective
Corporate Social Responsibility	Lecture: 15 Seminar: 15	Graded credit	2	Elective
Humanities Block	Lecture: 15 Seminar: 15	Graded credit	2	Obligatory group
The student chooses one subject				
Ethics of New Technologies	Lecture: 15 Seminar: 15	Graded credit	2	Elective
Ethic of Management and New Technologies	Lecture: 15 Seminar: 15	Graded credit	2	Elective
Historical and Modern Perspectives of Leadership	Lecture: 15 Seminar: 15	Graded credit	2	Elective
Sum	**240**		**25**	

Specialty: Business Intelligence

Subject	Number of hours	Form of verification	ECTS points	Mandatoriness
Prescriptive Analytics	Lecture: 30 Laboratory: 30	Lecture: Graded credit Laboratory: Graded credit	Lecture: 2 Laboratory: 3	Obligatory in specialty
Sum	**60**		**5**	

Syllabuses

Wrocław University of Science and Technology

Business Intelligence Workplace

Educational subject description sheet

Basic information

Field of study Business Engineering	**Education cycle** 2025/2026
Speciality Business Intelligence	**Subject code** W8NIZZ/000BITS.31PS.02957.25
Organizational unit Faculty of Management	**Group of classes** Yes
Study level second degree 3 semesters	**Lecture languages** English
Study form full-time studies	**Mandatoriness** Obligatory in specialty
Education profile general academic profile	**Block** Specialty subjects
	Subject related to scientific research Yes

Semester	**Examination**	**Number of ECTS points**
Semester 1	Graded credit **Activities and hours** Lecture: 15 Laboratory: 30 Project: 15	5.0

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Identifies basic methods useful for business intelligence applications.	K2_IZ_W01, K2_IZ_W02
PEU_W02	Identifies computing environments (MATLAB, Python).	K2_IZ_W03, K2_IZ_W05
In terms of skills		
PEU_U01	Uses selected computational environments to implement basic BI tasks.	K2_IZ_U03, K2_IZ_U06

PEU_U02	Describes selected BI concepts using mathematical formalism and draws conclusions.	K2_IZ_U17
In terms of social competences		
PEU_K01	Is aware of the need for independent, critical assessment of the scope and level of knowledge related to descriptive, predictive and prescriptive analytics. Is prepared to independently search for knowledge in this area.	K2_IZ_K02, K2_IZ_K07

Program content ensuring learning outcomes

Students will master programming skills in a selected environment (e.g., Python) useful in BI applications. In particular, they will learn about visualization methods for time series data and the forecaster's toolbox. In addition, they will acquire knowledge about using agent-based models and what-if scenarios to support decision-making.

Calculation of ECTS points

Activity form	**Activity hours**
Lecture	15
Laboratory	30
Project	15
Preparation of a project	30
Preparaton for classes	15
Prepararation for an exam/credit	18
Credit/Exam	2
Student workload	**Hours** 125

Wrocław University of Science and Technology

Creative and Design Thinking Workshop

Educational subject description sheet

Basic information

Field of study
Business Engineering

Speciality
-

Organizational unit
Faculty of Management

Study level
second degree 3 semesters

Study form
full-time studies

Education profile
general academic profile

Education cycle
2025/2026

Subject code
W8NIZZ/000S.31PK.02937.25

Lecture languages
English

Mandatoriness
Obligatory

Block
Major-specific subjects

Subject related to scientific research
Yes

Semester	Activities, hours, ECTS and examination
Semester 1	• Seminar: 30 h, 2 ECTS

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Describes multidisciplinary approach to innovation as a powerful way to incorporate the perspectives of many kinds of people.	K2_IZ_W08, K2_IZ_W09
PEU_W02	Knows to approach innovation challenges from a human-centered perspective.	K2_IZ_W08, K2_IZ_W09
PEU_W03	Knows implementation of each step of design thinking process and ideation techniques, to achieve innovative results.	K2_IZ_W09
PEU_W04	Knows the Sustainable Development Goals and all targets.	K2_IZ_W09
In terms of skills		
PEU_U01	Able to define and re-define innovation challenges by asking the right questions, and not necessarily focusing on the right answers but applying lateral and divergent thinking.	K2_IZ_U14, K2_IZ_U15, K2_IZ_U18, K2_IZ_U19

PEU_U02	Able to apply design thinking in wide range of context, from personal to global.	K2_IZ_U14, K2_IZ_U18, K2_IZ_U19
PEU_U03	Able to investigate about design problems and opportunities.	K2_IZ_U14, K2_IZ_U18, K2_IZ_U19
PEU_U04	Able to visually and articulacy explain design and prototyping.	K2_IZ_U14, K2_IZ_U15, K2_IZ_U18, K2_IZ_U19
In terms of social competences		
PEU_K01	Is oriented to problem identification and creative problem solving.	K2_IZ_K02, K2_IZ_K04, K2_IZ_K06
PEU_K02	Is open to effectively collaborate with different people in fast-paced, dynamic, cross-disciplinary team settings.	K2_IZ_K02, K2_IZ_K04
PEU_K03	Is open to gain a greater acceptance towards dealing with ambiguity and uncertainty in their professional and personal lives.	K2_IZ_K04, K2_IZ_K06
PEU_K04	Shows competence to approach many different problems and challenges with an open, creative, empathetic, and prototype-driven mind set.	K2_IZ_K04, K2_IZ_K06
PEU_K05	Shows increased confidence in creative abilities.	K2_IZ_K06

Program content ensuring learning outcomes

This subject explores the application of design thinking to problem-solving within the context of sustainable development. It begins with fostering creative thinking and teamwork, then guides students through defining a problem statement, empathizing with users, ideating solutions using SCAMPER, prototyping, and testing. The classes culminates in presentations and feedback to prepare for a second iteration of the design process.

Calculation of ECTS points

Activity form	**Activity hours**
Seminar	30
Conducting empirical studies	5
Preparation of a project	10
Preparation of a report/summary/presentation/paper	3
Credit/Exam	2
Student workload	**Hours** 50

Wrocław University of Science and Technology

Physics of Complex Systems

Educational subject description sheet

Basic information

Field of study Business Engineering	**Education cycle** 2025/2026
Speciality -	**Subject code** W8NIZZ/000S.31PF.02938.25
Organizational unit Faculty of Management	**Group of classes** Yes
Study level second degree 3 semesters	**Lecture languages** English
Study form full-time studies	**Mandatoriness** Obligatory
Education profile general academic profile	**Block** Subjects of basic education - physics

Semester	**Examination**	**Number of ECTS points**
Semester 1	Graded credit **Activities and hours** Lecture: 15 Laboratory: 15	3.0

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Classifies and describes models and methods, especially simulation ones, used to solve decision-making problems in management.	K2_IZ_W01
PEU_W02	Describes the interactions occurring in selected complex physical systems and their influence on the dynamics of the system, and distinguishes between different models of describing these interactions.	K2_IZ_W11
PEU_W03	Illustrates and explains phenomena resulting from interactions in complex systems; identifies and indicates examples of practical applications of the analysis of these interactions.	K2_IZ_W11
In terms of skills		

PEU_U01	Plans and organizes the course of computer simulations and analysis of parameters of selected physical systems, selecting appropriate numerical methods.	K2_IZ_U16
PEU_U02	Analyzes and interprets the results of computer simulations, assesses the accuracy and reliability of the results, and verifies the correctness of the obtained results, taking into account possible errors resulting from modeling and user interaction with the software.	K2_IZ_U16
PEU_U03	Formulates and describes physical phenomena occurring in selected complex systems encountered in everyday and professional life, using mathematical and physical formalism in a computer environment.	K2_IZ_U17
PEU_U04	Analyzes data obtained from computer simulations of selected physical phenomena, interprets the results based on mathematical-physical formalism, and draws conclusions regarding the dynamics and behavior of the system.	K2_IZ_U17
In terms of social competences		
PEU_K01	Complies with the principles of professional ethics when working in a computer laboratory, ensures the reliability of simulation analyses performed and demonstrates responsibility for the correctness of the results and their interpretation.	K2_IZ_K07
PEU_K02	Identifies ethical dilemmas related to the use of numerical tools and analysis of results in the physics of complex systems, takes up the challenges related to a critical approach to simulation results and declares readiness to correct irregularities in his/her work.	K2_IZ_K07

Program content ensuring learning outcomes

The course includes lectures and computer labs aimed at introducing participants to the physics of complex systems and methods of modeling complex systems. The classes provide theoretical knowledge and practical skills in the macroscopic and microscopic description of complex systems, including the basics of thermodynamics, statistical physics and the modern theory of phase transitions and critical phenomena. Topics covered include the Ehrenfest model, the Ising model, the percolation model, as well as analysis of phase transitions and critical phenomena using Monte Carlo methods and analytical techniques such as the mean-field method. In addition, students are introduced to the interdisciplinary applications of the methods and models discussed, particularly in the social sciences, which allows them to better understand the broad context of the practical use of the physics of complex systems.

Calculation of ECTS points

Activity form	**Activity hours**
Lecture	15
Laboratory	15
Preparaton for classes	13
Preparation of a report/summary/presentation/paper	15
Prepararation for an exam/credit	15
Credit/Exam	2

Student workload	Hours 75

Wrocław University of Science and Technology

Business Simulations

Educational subject description sheet

Basic information

Field of study Business Engineering	**Education cycle** 2025/2026
Speciality Business Intelligence	**Subject code** W8NIZZ/000BITS.31PK.02939.25
Organizational unit Faculty of Management	**Group of classes** Yes
Study level second degree 3 semesters	**Lecture languages** English
Study form full-time studies	**Mandatoriness** Obligatory
Education profile general academic profile	**Block** Major-specific subjects
	Subject related to scientific research Yes

Semester	**Examination**	**Number of ECTS points**
Semester 1	Graded credit **Activities and hours** Lecture: 15 Laboratory: 30	4.0

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Defines the essentials of simulation and characterizes the methodologies of selected simulation methods to support decision-making in a changing or uncertain environment.	K2_IZ_W01
PEU_W02	Selects methods and simulation tools for identifying and modeling complex management decision-making processes.	K2_IZ_W05
In terms of skills		

PEU_U01	Builds simulation models in accordance with learned methodologies; plans and conducts computer simulation experiments; uses simulation models in solving complex management decision-making problems; draws conclusions based on simulations performed.	K2_IZ_U01, K2_IZ_U04, K2_IZ_U05
In terms of social competences		
PEU_K01	Acts in accordance with ethical principles; interacts and works in groups and teams.	K2_IZ_K02, K2_IZ_K07

Program content ensuring learning outcomes

During the subject, students will learn various methodologies for building simulation models to support management decision-making problems. The selected methodologies will be used in laboratory classes to build simulation models, verifying them, and then conducting computer experiments to describe the current state and forecast future states of the organization.

Calculation of ECTS points

Activity form	**Activity hours**
Lecture	15
Laboratory	30
Preparaton for classes	28
Preparation of a report/summary/presentation/paper	2
Preparation of a project	15
Prepararation for an exam/credit	8
Credit/Exam	2
Student workload	**Hours** 100

Wrocław University of Science and Technology

Business Simulations Project

Educational subject description sheet

Basic information

Field of study
Business Engineering

Speciality
-

Organizational unit
Faculty of Management

Study level
second degree 3 semesters

Study form
full-time studies

Education profile
general academic profile

Education cycle
2025/2026

Subject code
W8NIZZ/000S.31PK.02940.25

Lecture languages
English

Mandatoriness
Obligatory

Block
Major-specific subjects

Subject related to scientific research
Yes

Semester	Activities, hours, ECTS and examination
Semester 1	• Project: 15 h, 2 ECTS, Graded credit

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Characterizes and describes simulation methods used for modeling and decision support in organizations. Explain assumptions and design principles of simulation models.	K2_IZ_W01
PEU_W02	Identifies and utilizes simulation modeling software.	K2_IZ_W05
In terms of skills		
PEU_U01	Analyzes example simulation models.Plans and implements a model for a problem in the field of management.	K2_IZ_U01, K2_IZ_U05
PEU_U02	Plans and executes an experiment using simulation models.	K2_IZ_U04
In terms of social competences		
PEU_K01	Supports others while working on the project. Identifies issues in the project and is open to discussion.	K2_IZ_K02, K2_IZ_K07

Program content ensuring learning outcomes

The course takes the form of a project which aims to familiarize the students with:

- principles of creating simulation models, in particular agent-based models,
- methods of using simulation models to describe phenomena observed in organizations,
- techniques of analyzing agent-based models.

Open-source software is used to illustrate the topics. The course ends with the submission and verbal defense of the project.

Calculation of ECTS points

Activity form	**Activity hours**
Project	15
Preparation of a report/summary/presentation/paper	15
Preparation of a project	18
Credit/Exam	2
Student workload	**Hours** 50

Wrocław University of Science and Technology

Descriptive Analytics

Educational subject description sheet

Basic information

Field of study Business Engineering	**Education cycle** 2025/2026
Speciality -	**Subject code** W8NIZZ/000S.31PM.02941.25
Organizational unit Faculty of Management	**Lecture languages** English
Study level second degree 3 semesters	**Mandatoriness** Obligatory
Study form full-time studies	**Block** Subjects of basic education - mathematics
Education profile general academic profile	**Subject related to scientific research** Yes

Semester	Activities, hours, ECTS and examination
Semester 1	• Lecture: 30 h, 3 ECTS, Exam • Laboratory: 30 h, 2 ECTS, Graded credit

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Identifies ways to use the Matlab environment to prepare data used to make business decisions.	K2_IZ_W02
PEU_W02	Identifies ways to use the Matlab environment to analyze and visualize market data.	K2_IZ_W02, K2_IZ_W03, K2_IZ_W05
PEU_W03	Explains descriptive statistics and econometric modeling, covering topics related to analysis of market data, estimation and verification of regression models, and hypothesis testing.	K2_IZ_W04
In terms of skills		
PEU_U01	Using the Matlab environment, visualizes market data, describes their statistical properties and estimates parameters of regression models for the purpose of supporting enterprise decisions.	K2_IZ_U02, K2_IZ_U09

PEU_U02	Selects an econometric model and its estimation method. Formulates research hypotheses and selects an appropriate statistical test.	K2_IZ_U08
In terms of social competences		
PEU_K01	Is prepared to behave in a professional and ethical manner when preparing reports and presenting the obtained results.	K2_IZ_K07

Program content ensuring learning outcomes

The course covers advanced methods and tools for data analysis including descriptive analysis, linear and nonlinear regression, regularization methods and issues related to testing statistical hypotheses. Theoretical problems are illustrated with examples using data describing real market processes. During the laboratories, students become familiar with the Matlab programming environment and learn to implement the statistical and econometric models to analyze empirical data.

Calculation of ECTS points

Activity form	**Activity hours**
Lecture	30
Laboratory	30
Preparation of a report/summary/presentation/paper	25
Credit/Exam	4
Self-study of class topics	20
Prepararation for an exam/credit	16
Student workload	**Hours** 125

Wrocław University of Science and Technology

Contemporary Economics

Educational subject description sheet

Basic information

Field of study Business Engineering	**Education cycle** 2025/2026
Speciality -	**Subject code** W8NIZZ/000S.31PK.02942.25
Organizational unit Faculty of Management	**Group of classes** Yes
Study level second degree 3 semesters	**Lecture languages** English
Study form full-time studies	**Mandatoriness** Obligatory
Education profile general academic profile	**Block** Major-specific subjects
	Subject related to scientific research Yes

Semester Semester 1	**Examination** Graded credit **Activities and hours** Lecture: 15 Project: 15	**Number of ECTS points** 2.0

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Identifies the place of economics among other scientific disciplines. Discribes basic macroeconomic theories.	K2_IZ_W06
PEU_W02	Explains the relationships between economic processes in the context of economic growth and the international economy. Characterizes the basic tools that enable influencing the market and iassesses the consequences of introduced regulations.	K2_IZ_W06, K2_IZ_W07, K2_IZ_W14
In terms of skills		
PEU_U01	Applies theoretical knowledge to the analysis of macroeconomic problems.	K2_IZ_U11, K2_IZ_U12, K2_IZ_U20

PEU_U02	Identifies and analyses factors influencing the economy and evaluates introduced regulations.	K2_IZ_U20, K2_IZ_U21
In terms of social competences		
PEU_K01	Presents and justifies the opinion on the operation of the market on a macroeconomic scale.	K2_IZ_K02, K2_IZ_K07

Program content ensuring learning outcomes

During the course, students will synthesize the elements necessary to understand a current economic problem. In addition, they will activate and mobilize their economic knowledge. Students will conduct clear and structured analytical reasoning on contemporary economic problems, using conceptual frameworks and analytical models. Students will have the opportunity to demonstrate intellectual independence in reasoning and analyzing economic issues (e.g. the relationship between inflation and product prices, unemployment rate and social transfers). During the course, they will also prepare their project, drawing on the acquired economic knowledge, specialized business press (e.g. Economic Voice) and new literature. This will be followed by a discussion in which they will defend their view.

Calculation of ECTS points

Activity form	**Activity hours**
Lecture	15
Project	15
Preparaton for classes	3
Preparation of a project	5
Self-study of class topics	4
Conducting empirical studies	4
Prepararation for an exam/credit	2
Credit/Exam	2
Student workload	**Hours** 50

Wrocław University of Science and Technology

Contemporary Management

Educational subject description sheet

Basic information

Field of study Business Engineering	**Education cycle** 2025/2026
Speciality -	**Subject code** W8NIZZ/000S.31PK.02679.25
Organizational unit Faculty of Management	**Lecture languages** English
Study level second degree 3 semesters	**Mandatoriness** Obligatory
Study form full-time studies	**Block** Major-specific subjects
Education profile general academic profile	**Subject related to scientific research** Yes

Semester	Activities, hours, ECTS and examination
Semester 1	• Lecture: 30 h, 2 ECTS, Graded credit • Seminar: 30 h, 2 ECTS, Graded credit

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Explains the impact of global conditions on the competitiveness of organizations.	K2_IZ_W06
PEU_W02	Explains the modern concepts of organizational management.	K2_IZ_W07
PEU_W03	Characterizes the complexity and complexity of substantive and management problems in the organization.	K2_IZ_W14
PEU_W04	Recognizes the interdependent elements affecting entrepreneurial processes.	K2_IZ_W17
In terms of skills		
PEU_U01	Analyzes the causes and dynamics of events and phenomena in the organization as a whole, in the context of their internal and external conditions. Identifies, analyzes and evaluates complex management and substantive problems in the organization.	K2_IZ_U11

PEU_U02	Develops solutions to complex management and substantive problems in the organization. Justifies, selects and verifies solutions according to established priorities, in the context of internal and external conditions.	K2_IZ_U12
PEU_U03	Designs complex changes in the organization.	K2_IZ_U20
In terms of social competences		
PEU_K01	Is open to critical and ethical analysis of problems arising in the workplace. Anticipates the consequences of decisions.	K2_IZ_K07
PEU_K02	Semonstrates readiness for group exploration and elestic selection of methods and tools for solving problems that arise in the workplace.	K2_IZ_K02

Program content ensuring learning outcomes

The course is conducted in order to familiarize students with the issues of the determinants of modern business and the dynamics of the organizational environment.
The lectures will impart knowledge regarding basic management concepts and contemporary economic challenges (such as entrepreneurship, globalization, ethics, diversity, innovation), as well as the impact of these challenges on the sphere of planning, managerial decision-making, division of labor and creation of organizational structures, leadership, culture and organizational change.
The seminars will provide skills in selecting, justifying and applying management methods and techniques in identifying, analyzing and resolving managerial and substantive problems in the organization. In particular, in linking contemporary management challenges with new business models, forms of financing, distributed value chains, e-business, the information society, knowledge management and organizational development.

Calculation of ECTS points

Activity form	**Activity hours**
Lecture	30
Seminar	30
Preparaton for classes	10
Prepararation for an exam/credit	10
Preparation of a report/summary/presentation/paper	18
Credit/Exam	2
Student workload	**Hours** 100

Wrocław University of Science and Technology

Foreign Language 2.1

Educational subject description sheet

Basic information

Field of study
lektoraty

Speciality
-

Organizational unit
Wrocław University of Science and Technology

Study level
second degree

Study form
full-time studies

Education profile
general academic profile

Education cycle
2025/2026

Subject code
PWRSJOS.97JO.02684.25

Lecture languages
English

Mandatoriness
Elective

Block
Foreign languages

Semesters	Activities, hours, ECTS and examination
Semester 1, Semester 2, Semester 3	• Classes: 30 h, 2 ECTS, Graded credit

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of skills		
PEU_U01	Student has knowledge, skills and competences consistent with the requirements specified for the minimum B2 level according to the Common European Framework of Reference for Languages; knows, understands and uses linguistic means (grammatical, lexical and stylistic) from academic, specialist and technical languages used in the field of study and in the academic and professional environment; communicates in an intercultural and professional environment; understands and has the ability to analyze foreign-language specialist texts; improves their skills in the area of specialized and academic languages.	SJO_S2_U01

Program content ensuring learning outcomes

B2 plus English, French, Spanish, GermanC1 plus English languageGeneral educational content

Formation and deepening of communicative competence in academic and professional settings.
Interaction appropriate to the appropriate level of linguistic competence, such as the student's own profile for academic and professional purposes. Deepening creative, receptive and interactive competence in a team.
Language in communication in specialized and professional fields in the modern world. Verbal and non-verbal communication - functioning freely in an intercultural environment, conducting discourse, polemics, analysis of specialized texts.

Calculation of ECTS points

Activity form	**Activity hours**
Classes	30
Preparaton for classes	30
Student workload	**Hours** 60

Wrocław University of Science and Technology

AI in Management

Educational subject description sheet

Basic information

Field of study Business Engineering	**Education cycle** 2025/2026
Speciality -	**Subject code** W8NIZZ/000S.31PK.05989.25
Organizational unit Faculty of Management	**Lecture languages** English
Study level second degree 3 semesters	**Mandatoriness** Obligatory
Study form full-time studies	**Block** Major-specific subjects
Education profile general academic profile	

Semester	Activities, hours, ECTS and examination
Semester 1	• Project: 15 h, 1 ECTS, Graded credit

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Characterizes the applications of artificial intelligence in management, identifies methods for integrating artificial intelligence tools into organizational processes, and analyzes their impact on decision-making, process optimization, and market trend forecasting.	K2_IZ_W03
In terms of skills		
PEU_U01	Analyzes and develops the application of artificial intelligence tools in management, interpreting data from various sources (including foreign-language materials) and justifying the selection of solutions that support managerial decision-making and trend forecasting.	K2_IZ_U03

PEU_U02	Verifies and tests advanced artificial intelligence tools used in management, assesses their effectiveness, and identifies opportunities for process optimization in organizations. Plans the implementation of artificial intelligence in various organizational departments, considering its impact on data analysis and decision-making.	K2_IZ_U03
In terms of social competences		
PEU_K01	Initiates and co-develops AI-driven changes in management, demonstrating an entrepreneurial mindset and actively participating in the planning and implementation of innovations. Respects the ethical aspects of artificial intelligence use, ensuring transparency and responsibility in data management, process control, and the broader impact of AI on organizations and society.	K2_IZ_K07

Program content ensuring learning outcomes

The course is conducted in the form of project-based workshops, aimed at introducing students to the application of artificial intelligence in management. The sessions focus on the practical use of artificial intelligence for data analysis, decision-making support, trend forecasting, and process optimization across various organizational areas, such as finance, HR, marketing, and project management.
During the course, students will:

- explore key concepts and tools of artificial intelligence used in management,
- analyze and interpret data using artificial intelligence tools to identify key business indicators,
- develop scenarios for applying artificial intelligence in different organizational departments, including reporting and forecasting,
- test and adapt artificial intelligence algorithms for trend analysis and market change prediction,
- enhance teamwork skills in implementing artificial intelligence-based solutions,
- analyze real-world case studies of artificial intelligence implementations across different industries, identifying challenges and benefits,
- develop and present a team-based artificial intelligence implementation project within a selected business process.

The course is based on case studies, project work, and interactive workshops, ensuring that students gain hands-on experience in implementing artificial intelligence in management. The final outcome will be a team-developed artificial intelligence implementation project, which could have practical applications in a real business environment.

Calculation of ECTS points

Activity form	**Activity hours**
Project	15
Self-development of practical skills	3
Preparation of a project	5
Credit/Exam	2
Student workload	**Hours** 25

Wrocław University of Science and Technology

Predictive Analytics

Educational subject description sheet

Basic information

Field of study Business Engineering	**Education cycle** 2025/2026
Speciality Business Intelligence	**Subject code** W8NIZZ/000BITS.32PS.02958.25
Organizational unit Faculty of Management	**Lecture languages** English
Study level second degree 3 semesters	**Mandatoriness** Obligatory in specialty
Study form full-time studies	**Block** Specialty subjects
Education profile general academic profile	**Subject related to scientific research** Yes

Semester	Activities, hours, ECTS and examination
Semester 2	• Lecture: 30 h, 3 ECTS • Laboratory: 30 h, 2 ECTS

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Identifies advanced forecasting methods. Selects linear and nonlinear forecasting techniques to support decisions in a changing or uncertain environment.	K2_IZ_W04, K2_IZ_W05
In terms of skills		
PEU_U01	Selects the appropriate forecasting method and creates a forecasting model. Assesses the quality of forecasts. Uses forecasting techniques to solve complex decision-making problems in management.	K2_IZ_U04, K2_IZ_U05
In terms of social competences		
PEU_K01	Is aware of the need for independent, critical assessment of the scope and level of knowledge in the field of predictive analytics. Is prepared to independently search for knowledge in this area.	K2_IZ_K07

Program content ensuring learning outcomes

Students will acquire knowledge about forecasting methods, in particular regarding exponential smoothing, regression models, forecast averaging, evaluation of forecasts, as well as hierarchical and probabilistic forecasting. Working with market data, they will acquire the skills to apply this knowledge in business practice. They will also try to replicate the results of a selected research article on forecasting.

Calculation of ECTS points

Activity form	**Activity hours**
Lecture	30
Laboratory	30
Self-development of practical skills	15
Preparation of a report/summary/presentation/paper	15
Conducting empirical studies	15
Prepararation for an exam/credit	16
Credit/Exam	4
Student workload	**Hours** 125

Wrocław University of Science and Technology

Visual Analytics

Educational subject description sheet

Basic information

Field of study Business Engineering	**Education cycle** 2025/2026
Speciality Business Intelligence	**Subject code** W8NIZZ/000BITS.32PS.02959.25
Organizational unit Faculty of Management	**Group of classes** Yes
Study level second degree 3 semesters	**Lecture languages** English
Study form full-time studies	**Mandatoriness** Obligatory in specialty
Education profile general academic profile	**Block** Specialty subjects
	Subject related to scientific research Yes

Semester Semester 2	**Examination** Graded credit **Activities and hours** Lecture: 15 Laboratory: 15	**Number of ECTS points** 2.0

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Identifies methods and techniques of modern analytics useful in management decision-making processes.	K2_IZ_W02
PEU_W02	Characterizes computer-based decision support tools and data visualization and reporting systems.	K2_IZ_W04
In terms of skills		
PEU_U01	Selects data mining techniques and applies them to data analysis.	K2_IZ_U02, K2_IZ_U07
PEU_U02	Selects and implements selected information technologies to visualize data and prepare data reports.	K2_IZ_U07, K2_IZ_U09

In terms of social competences		
PEU_K01	Cooperates and works in a group, appropriately dividing the tasks to be performed among individual group members.	K2_IZ_K07
PEU_K02	Independently develops knowledge and skills, demonstrates readiness to identify, analyze and solve problems in the identification and analysis of decision-making problems using data exploration, visualization and reporting.	K2_IZ_K07

Program content ensuring learning outcomes

The student learns advanced visual analytics algorithms and advanced data mining techniques, including clustering and grouping algorithms. Acquires data reporting skills through the use of advanced data visualization. Masters business modeling and analysis techniques to transform data into useful conclusions in the management process.

Calculation of ECTS points

Activity form	**Activity hours**
Lecture	15
Laboratory	15
Preparation of a project	18
Credit/Exam	2
Student workload	**Hours** 50

Wrocław University of Science and Technology

Web Scraping and Analysis

Educational subject description sheet

Basic information

Field of study Business Engineering	**Education cycle** 2025/2026
Speciality Business Intelligence	**Subject code** W8NIZZ/000BITS.32PS.02960.25
Organizational unit Faculty of Management	**Lecture languages** English
Study level second degree 3 semesters	**Mandatoriness** Obligatory in specialty
Study form full-time studies	**Block** Specialty subjects
Education profile general academic profile	**Subject related to scientific research** Yes

Semester	Activities, hours, ECTS and examination
Semester 2	• Lecture: 30 h, 2 ECTS • Laboratory: 15 h, 1 ECTS

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Characterizes methods of acquiring and analyzing data from websites.	K2_IZ_W02
PEU_W02	Identifies and selects R language procedures for processing strings.	K2_IZ_W03
In terms of skills		
PEU_U01	Designs a procedure for acquiring data from websites.	K2_IZ_U02, K2_IZ_U06
PEU_U02	Selects and applies methods for analyzing data from websites using the R language.	K2_IZ_U06, K2_IZ_U07
In terms of social competences		
PEU_K01	Presents in his oral or written statements an understanding of the essence of ethics in business.	K2_IZ_K07

Program content ensuring learning outcomes

The course focuses on methods and tools for acquiring and processing large datasets from websites. Participants will learn efficient techniques for rapidly collecting data on a large scale, automating the entire process, and repeating these actions cyclically. Particular emphasis will be placed on transforming acquired data into useful information that supports decision-making processes. The course will also emphasize the proficient use of the R programming language at every stage of working with data - from acquisition and initial processing (data preparation) to analysis and result presentation.

Calculation of ECTS points

Activity form	**Activity hours**
Lecture	30
Laboratory	15
Preparation of a report/summary/presentation/paper	18
Prepararation for an exam/credit	5
Preparaton for classes	5
Credit/Exam	2
Student workload	**Hours** 75

Wrocław University of Science and Technology

BI Day

Educational subject description sheet

Basic information

Field of study Business Engineering	**Education cycle** 2025/2026
Speciality Business Intelligence	**Subject code** W8NIZZ/000BITS.32PS.02961.25
Organizational unit Faculty of Management	**Lecture languages** English
Study level second degree 3 semesters	**Mandatoriness** Obligatory in specialty
Study form full-time studies	**Block** Specialty subjects
Education profile general academic profile	**Subject related to scientific research** Yes

Semester	Activities, hours, ECTS and examination
Semester 2	• Seminar: 15 h, 1 ECTS, Graded credit

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Selects arguments, illustrates theses using multimedia tools, presents results of own research in the area of business intelligence.	K2_IZ_W07, K2_IZ_W09
In terms of skills		
PEU_U01	Argues, demonstrates research findings, evaluates talks of other students, prepares 3-minute presentations, discusses business intelligence issues.	K2_IZ_U08, K2_IZ_U22
In terms of social competences		
PEU_K01	Identifies problems, defends his/her beliefs and expresses judgements in the context of business intelligence.	K2_IZ_K05, K2_IZ_K06
PEU_K02	Respects and supports others.	K2_IZ_K01, K2_IZ_K02

Program content ensuring learning outcomes

The subject is split into two days. During the 1st BI Day students engage in a business-oriented activity (e.g., a social simulation game, LEGO-Scrum) under the watchful eyes of industry experts. During the 2nd BI Day students pitch their best projects or preliminary Master thesis results (in the form of 3-minute talks) and interact with BI professionals.

Calculation of ECTS points

Activity form	**Activity hours**
Seminar	15
Preparation of a report/summary/presentation/paper	8
Credit/Exam	2
Student workload	**Hours** 25

Wrocław University of Science and Technology

Digital Marketing and Social Media

Educational subject description sheet

Basic information

Field of study Business Engineering	**Education cycle** 2025/2026
Speciality -	**Subject code** W8NIZZ/000S.32PK.02943.25
Organizational unit Faculty of Management	**Group of classes** Yes
Study level second degree 3 semesters	**Lecture languages** English
Study form full-time studies	**Mandatoriness** Obligatory
Education profile general academic profile	**Block** Major-specific subjects
	Subject related to scientific research Yes

Semester	**Examination**	**Number of ECTS points**
Semester 2	Graded credit **Activities and hours** Lecture: 15 Laboratory: 30	3.0

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Describes digital marketing and social media, its associated technologies, its management, and the ecosystem in which it is applied and managed.	K2_IZ_W07, K2_IZ_W08
PEU_W02	Recognizes the tools and techniques which are sufficient to allow comprehensive investigation into relevant digital marketing and social media related issues.	K2_IZ_W08, K2_IZ_W09
PEU_W03	Creates content and implements digital marketing campaign and analytics.	K2_IZ_W08, K2_IZ_W09
In terms of skills		

PEU_U01	Effectively uses digital and social media for business marketing.	K2_IZ_U11, K2_IZ_U13
PEU_U02	Adapts and demonstrates originality, insight, critical and reflective skills so as to make informed decisions in a dynamic online environment.	K2_IZ_U11, K2_IZ_U13
PEU_U03	Communicates effectively both orally and in writing, using a range of media.	K2_IZ_U13
In terms of social competences		
PEU_K01	Is capable of collaboratively developing and executing a digital marketing campaign, demonstrating effective teamwork by assuming diverse roles.	K2_IZ_K02
PEU_K02	Critically evaluates the ethical implications of digital marketing practices, including data privacy, targeted advertising, and the use of Generative AI, and proposes solutions to mitigate potential harms while adhering to professional standards of conduct.	K2_IZ_K07

Program content ensuring learning outcomes

This course provides a comprehensive exploration of digital marketing, combining theoretical lectures with practical laboratory experience, all culminating in a semester-long project. Lectures cover core concepts, including the digital landscape, market and competitor analysis, the use of AI in marketing, digital strategies and campaigns, social media marketing, and content creation. Labs provide hands-on experience in company and brand development, platform utilization, AI-driven analysis, campaign creation and implementation, web presence development, SEO/SEM, performance measurement, and the ethical use of Generative AI, all contributing to the final project.

Calculation of ECTS points

Activity form	**Activity hours**
Lecture	15
Laboratory	30
Preparaton for classes	8
Preparation of a report/summary/presentation/paper	5
Preparation of a project	15
Credit/Exam	2
Student workload	**Hours** 75

Wrocław University of Science and Technology

Creative and Design Thinking Project

Educational subject description sheet

Basic information

Field of study
Business Engineering

Speciality
-

Organizational unit
Faculty of Management

Study level
second degree 3 semesters

Study form
full-time studies

Education profile
general academic profile

Education cycle
2025/2026

Subject code
W8NIZZ/000S.32PK.04478.25

Lecture languages
English

Mandatoriness
Obligatory

Block
Major-specific subjects

Subject related to scientific research
Yes

Semester	Activities, hours, ECTS and examination
Semester 2	• Project: 15 h, 1 ECTS, Graded credit

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Describes multidisciplinary approach to innovation as a powerful way to incorporate the perspectives of many kinds of people.	K2_IZ_W08, K2_IZ_W09
PEU_W02	Characterizes to approach innovation challenges from a human-centered perspective.	K2_IZ_W08, K2_IZ_W09
PEU_W03	Explains the implementation of each step of the design thinking process and ideation techniques, to achieve innovative results.	K2_IZ_W09
PEU_W04	Identifies the Sustainable Development Goals and all targets.	K2_IZ_W09
In terms of skills		
PEU_U01	Defines and re-defines innovation challenges by asking the right questions and not necessarily focusing on the right answers but applies lateral and divergent thinking.	K2_IZ_U14, K2_IZ_U15, K2_IZ_U18, K2_IZ_U19

PEU_U02	Uses design thinking in a wide range of contexts, from personal to global.	K2_IZ_U14, K2_IZ_U18, K2_IZ_U19
PEU_U03	Investigates about design problems and opportunities.	K2_IZ_U14, K2_IZ_U18, K2_IZ_U19
PEU_U04	Visually and articulacy explains design and prototyping.	K2_IZ_U14, K2_IZ_U15, K2_IZ_U18, K2_IZ_U19
In terms of social competences		
PEU_K01	Is oriented to problem identification and creative problem solving.	K2_IZ_K02, K2_IZ_K04, K2_IZ_K06
PEU_K02	Effectively collaborates with different people in fast-paced, dynamic, cross-disciplinary team settings.	K2_IZ_K02, K2_IZ_K04
PEU_K03	Is able to have greater acceptance towards dealing with ambiguity and uncertainty in professional and personal life.	K2_IZ_K04, K2_IZ_K06
PEU_K04	Approaches many different problems and challenges with an open, creative, empathetic, and prototype-driven mind set.	K2_IZ_K04, K2_IZ_K06
PEU_K05	Demonstrates increased confidence in creative abilities.	K2_IZ_K06

Program content ensuring learning outcomes

This program focuses on iterative development of a project and business plan. Semester 2 involves refining the project based on feedback, preparing a prototype for further evaluation, and integrating a business model canvas. The final phase includes presenting a final prototype, business plan, and pitch.

Calculation of ECTS points

Activity form	**Activity hours**
Project	15
Conducting empirical studies	3
Preparation of a project	3
Preparation of a report/summary/presentation/paper	2
Credit/Exam	2
Student workload	**Hours** 25

Wrocław University of Science and Technology

Games and Decisions in Management

Educational subject description sheet

Basic information

Field of study Business Engineering	**Education cycle** 2025/2026
Speciality -	**Subject code** W8NIZZ/000S.32PK.02944.25
Organizational unit Faculty of Management	**Lecture languages** English
Study level second degree 3 semesters	**Mandatoriness** Obligatory
Study form full-time studies	**Block** Major-specific subjects
Education profile general academic profile	**Subject related to scientific research** Yes

Semester	Activities, hours, ECTS and examination
Semester 2	• Lecture: 30 h, 2 ECTS, Graded credit • Laboratory: 30 h, 2 ECTS, Graded credit

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Describes various decision-making models, such as game-theory models and robust/stochastic optimization.	K2_IZ_W04, K2_IZ_W09, K2_IZ_W10
PEU_W02	Identifies the risks and uncertainties that arise in decision-making problems.	K2_IZ_W04, K2_IZ_W09, K2_IZ_W10
In terms of skills		
PEU_U01	Constructs an appropriate mathematical model for practical decision-making problems.	K2_IZ_U01, K2_IZ_U05
PEU_U02	Applies mathematical modeling languages to solve practical decision-making problems and interprets the obtained solution.	K2_IZ_U01, K2_IZ_U05
In terms of social competences		

PEU_K01	Solves practical decision-making problems in organizations and is able to present the obtained solution.	K2_IZ_K07

Program content ensuring learning outcomes

During the lecture, students will learn advanced methods of single and multi-person decision making, under risk and uncertainty. Selected stochastic and robust optimization models, non-cooperative and cooperative games, and decision-making methods under risk, such as decision trees and decision networks, will be discussed. Applications of these models in management will be shown. During the laboratory, selected models will be implemented using modern mathematical modeling languages. The aim of the course is to familiarize students with advanced decision support tools and to describe the behavior of complex systems.

Calculation of ECTS points

Activity form	**Activity hours**
Lecture	30
Laboratory	30
Preparaton for classes	32
Prepararation for an exam/credit	6
Credit/Exam	2
Student workload	**Hours** 100

Wrocław University of Science and Technology

Project Management

Educational subject description sheet

Basic information

Field of study Business Engineering	**Education cycle** 2025/2026
Speciality -	**Subject code** W8NIZZ/000S.32PK.02945.25
Organizational unit Faculty of Management	**Lecture languages** English
Study level second degree 3 semesters	**Mandatoriness** Obligatory
Study form full-time studies	**Block** Major-specific subjects
Education profile general academic profile	**Subject related to scientific research** Yes

Semester	Activities, hours, ECTS and examination
Semester 2	• Lecture: 15 h, 2 ECTS, Exam • Laboratory: 30 h, 2 ECTS, Graded credit • Project: 15 h, 2 ECTS, Graded credit

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Explains project planning and control methods.	K2_IZ_W10, K2_IZ_W15
PEU_W02	Lists the problems and challenges encountered in project management related to the human and social aspects.	K2_IZ_W15, K2_IZ_W16
In terms of skills		
PEU_U01	Uses Microsoft Project to plan and control projects.	K2_IZ_U15, K2_IZ_U23
PEU_U02	Creates a project proposal for a specific call.	K2_IZ_U13, K2_IZ_U15, K2_IZ_U23
In terms of social competences		
PEU_K01	Respects the principles of sustainable management in project management.	K2_IZ_K07

PEU_K02	Is capable of working in a team on a grant proposal.	K2_IZ_K02

Program content ensuring learning outcomes

The subject will present methods and approaches of advanced project management: advanced project scheduling, project control, project stakeholders management, risk management, metrics based management, sustainable project management, project portfolio management. Real world examples will be used. The classes will encourage students to look critically at various project management methods and techniques, and to adapt the selected approach to the actual needs. In addition, students will learn about the advanced application possibilities of Microsoft Project, and acquire the fundamentals of grant application writing.

Calculation of ECTS points

Activity form	**Activity hours**
Lecture	15
Laboratory	30
Project	15
Credit/Exam	4
Prepararation for an exam/credit	10
Preparation of a project	20
Preparation of a report/summary/presentation/paper	8
Self-development of practical skills	10
Self-study of class topics	18
Preparaton for classes	20
Student workload	**Hours** 150

Wrocław University of Science and Technology

Business Anthropology

Educational subject description sheet

Basic information

Field of study
Business Engineering

Speciality
-

Organizational unit
Faculty of Management

Study level
second degree 3 semesters

Study form
full-time studies

Education profile
general academic profile

Education cycle
2025/2026

Subject code
W8NIZZ/000S.32HS.04479.25

Lecture languages
English

Mandatoriness
Obligatory

Block
Subjects from the fields of humanities or social sciences

Semester	Activities, hours, ECTS and examination
Semester 2	• Lecture: 15 h, 1 ECTS, Graded credit

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Characterizes social and cultural mechanisms of decision-making in organizations, identifies key factors influencing leadership, defines their significance in the context of cultural diversity, explains their impact on organizational dynamics, and illustrates examples of their application in a global business environment.	K2_IZ_W12
PEU_W02	Characterizes cultural, ethical, and humanistic norms and standards influencing the functioning of the economy and organizations.	K2_IZ_W13
PEU_W03	Characterizes the processes of building and functioning teams within organizations, identifies and distinguishes factors influencing their effectiveness.	K2_IZ_W16
In terms of skills		

PEU_U01	Evaluates the effectiveness of various leadership strategies, demonstrates the ability to plan and implement lifelong learning processes, and adapts these strategies to individual needs.	K2_IZ_U19
PEU_U02	Analyzes economic phenomena and identifies economic problems by examining their causes and effects within the context of diverse organizational cultures.	K2_IZ_U20
In terms of social competences		
PEU_K01	Accepts and values the importance of expert knowledge and opinions in decision-making and leadership within groups and organizations, considering cultural diversity.	K2_IZ_K05
PEU_K02	Takes responsibility for adhering to ethical principles, respects cultural and social differences, and takes on challenges to improve personal behaviors and attitudes in the workplace and life.	K2_IZ_K07

Program content ensuring learning outcomes

The aim of the course is to familiarize students with cultural diversity in global organizations, consumer behavior, the cultural context of leadership, and ethics in business anthropology. In seminar sessions, students are tasked with conducting analyses and simulations that enable them to apply the knowledge they have acquired in practice. By utilizing anthropological theories and methods, students learn to analyze issues such as consumer behavior, organizational culture, and the dynamics of global markets.

Calculation of ECTS points

Activity form	**Activity hours**
Lecture	15
Prepararation for an exam/credit	4
Preparaton for classes	4
Credit/Exam	2
Student workload	**Hours** 25

Wrocław University of Science and Technology

Diploma Seminar

Educational subject description sheet

Basic information

Field of study
Business Engineering

Speciality
Business Intelligence

Organizational unit
Faculty of Management

Study level
second degree 3 semesters

Study form
full-time studies

Education profile
general academic profile

Education cycle
2025/2026

Subject code
W8NIZZ/000BITS.32PK.00315.25

Lecture languages
English

Mandatoriness
Obligatory elective

Block
Major-specific subjects

Subject related to scientific research
Yes

Semester	Activities, hours, ECTS and examination
Semester 2	• Seminar: 15 h, 1 ECTS, Graded credit

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of skills		
PEU_U01	Is able to identify a decision-making problem in the field of management and plan its resolution and document it in the form of a thesis.	K2_IZ_U08
PEU_U02	Is able to conduct literature research and formulate research hypotheses, select appropriate methods, techniques and research tools.	K2_IZ_U22
PEU_U03	Is able to present hypotheses, research and analysis approaches, as well as substantively justify in discussion ideas and draw conclusions, and critically evaluate the planned actions and solutions of others.	K2_IZ_U22
In terms of social competences		
PEU_K01	Demonstrates care for the intellectual property of others and identifies and takes into account the legal and ethical aspects of the research and activities intended to be undertaken in the thesis.	K2_IZ_K01

PEU_K02	Accepts criticism of his knowledge level during group discussions and is oriented toward self-improvement in his knowledge and skills.	K2_IZ_K06

Program content ensuring learning outcomes

The goal of the course is to prepare students to carry out a thesis in accordance with the requirements of the department - to help identify and specify a decision-making problem in the field of management, research hypotheses, the aim of the work and plan its structure. Students acquire the ability to write a thesis presenting their achievements - starting with setting the goal and identifying the problem, planning the tasks to be completed, using appropriate sources, up to the implementation of the work and interpretation of the results, taking into account editorial guidelines.
Students master their ability in presenting their ideas, concepts, hypotheses and planned solutions to their listeners in a communicative manner, as well as consolidate their ability to have creative discussions in which they justify and defend their positions in a factual and substantive manner, and in the discussion draw attention to particularly important elements or flawed and overlooked aspects of their own and other students' planned work.

Calculation of ECTS points

Activity form	**Activity hours**
Seminar	15
Conducting literature research	2
Preparation of a report/summary/presentation/paper	2
Preparaton for classes	2
Prepararation for an exam/credit	2
Credit/Exam	2
Student workload	**Hours** 25

Wrocław University of Science and Technology

Managerial Accounting for Engineers

Educational subject description sheet

Basic information

Field of study Business Engineering	**Education cycle** 2025/2026
Speciality -	**Subject code** W8NIZZ/000S.32PK.05990.25
Organizational unit Faculty of Management	**Lecture languages** English
Study level second degree 3 semesters	**Mandatoriness** Obligatory
Study form full-time studies	**Block** Major-specific subjects
Education profile general academic profile	

Semester	**Activities, hours, ECTS and examination**
Semester 2	• Lecture: 15 h, 1 ECTS, Graded credit • Classes: 15 h, 1 ECTS, Graded credit • Laboratory: 15 h, 1 ECTS, Graded credit

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Characterizes and knows the methods and concepts of cost accounting and management accounting tools.	K2_IZ_W07
PEU_W02	Distinguishes the methods of constructing a budget and describes the individual financial report documents.	K2_IZ_W07, K2_IZ_W10
In terms of skills		
PEU_U01	Prepares cost calculations and analyses costs, plans, forecasts and optimises costs.	K2_IZ_U11, K2_IZ_U20
PEU_U02	Prepares the company's budget and demonstrates the effects of decisions made in the financial reports.	K2_IZ_U11, K2_IZ_U15, K2_IZ_U20
In terms of social competences		

PEU_K01	Is sensitive to the importance of managerial accounting in business practice and, above all, its role in providing the organization's management with the economic information necessary to secure the organization's management processes, including the performance of its basic functions.	K2_IZ_K07
PEU_K02	It is capable of collecting, processing and presenting financial and non-financial information about the project, the company and its environment, the purpose of which is to support managers in making operational and strategic decisions.	K2_IZ_K07

Program content ensuring learning outcomes

The course implements the learning outcomes in three forms. During lectures, the student deepens their knowledge in the field of cost calculation methods in making management decisions, budgeting, and modern methods of measuring and analyzing costs. The development of social skills and competences takes place in classes conducted in the form of exercises and in the computer laboratory. In accompanying forms, the student has the opportunity to implement knowledge in practical situations, analyzing and assessing problem situations and solving real managerial problems.

Calculation of ECTS points

Activity form	**Activity hours**
Lecture	15
Classes	15
Laboratory	15
Preparation of a project	15
Self-study of class topics	13
Credit/Exam	2
Student workload	**Hours** 75

Wrocław University of Science and Technology

Prescriptive Analytics

Educational subject description sheet

Basic information

Field of study Business Engineering	**Education cycle** 2025/2026
Speciality Business Intelligence	**Subject code** W8NIZZ/000BITS.34PS.02962.25
Organizational unit Faculty of Management	**Lecture languages** English
Study level second degree 3 semesters	**Mandatoriness** Obligatory in specialty
Study form full-time studies	**Block** Specialty subjects
Education profile general academic profile	**Subject related to scientific research** Yes

Semester	Activities, hours, ECTS and examination
Semester 3	• Lecture: 30 h, 2 ECTS, Graded credit • Laboratory: 30 h, 3 ECTS, Graded credit

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Identifies mathematical models to support decision making in management.	K2_IZ_W04
PEU_W02	Characterizes the creation of composite indicators under different preference structures.	K2_IZ_W02, K2_IZ_W05
In terms of skills		
PEU_U01	Develops decision making models.	K2_IZ_U05
PEU_U02	Selects and uses IT tools to solve decision-making problems in the field of management.	K2_IZ_U01, K2_IZ_U09
In terms of social competences		
PEU_K01	Is able to expand knowledge and skills as well as works in groups to formulate and evaluate decision making models.	K2_IZ_K07

Program content ensuring learning outcomes

During the lecture classes, students learn to develop mathematical models to support decision making in management and to build composite indicators. The lecture starts with an introduction to Linear Programming which is the main mathematical tool employed in this course. Multi-Objective and Multi-Criteria Analysis techniques are presented in depth to support decision-making. Performance measurement techniques are further presented in detail. The applicability of such models is highlighted with the presentation of real-case studies. During the laboratory classes, the students learn to use IT tools to solve decision-making problems, in the field of management, relying on the theory from Lectures. Matlab is the main programming environment combined with Gurobi, one of the most powerful solvers.

Calculation of ECTS points

Activity form	**Activity hours**
Lecture	30
Laboratory	30
Preparation of a report/summary/presentation/paper	25
Conducting literature research	23
Preparaton for classes	15
Credit/Exam	2
Student workload	**Hours** 125

Wrocław University of Science and Technology

Cloud Computing Services

Educational subject description sheet

Basic information

Field of study Business Engineering	**Education cycle** 2025/2026
Speciality Business Intelligence	**Subject code** W8NIZZ/000BITS.34PK.02946.25
Organizational unit Faculty of Management	**Group of classes** Yes
Study level second degree 3 semesters	**Lecture languages** English
Study form full-time studies	**Mandatoriness** Obligatory
Education profile general academic profile	**Block** Major-specific subjects
	Subject related to scientific research Yes

Semester Semester 3	**Examination** Graded credit **Activities and hours** Laboratory: 15 Seminar: 15	**Number of ECTS points** 3.0

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Identifies types and features of cloud technologies and services.	K2_IZ_W03
PEU_W02	Explains the applications of cloud services in management, supporting the operations of organizations and the engineer-manager job.	K2_IZ_W03
In terms of skills		
PEU_U01	Acquires the information necessary to recognize cutting-edge cloud technologies and services, compares offerings in the vendor market and matches them to the organization's needs and plans implementation.	K2_IZ_U03

PEU_U02	Compares the features, advantages, disadvantages and applications of existing cloud technologies and can critically evaluate them.	K2_IZ_U06
PEU_U03	Selects and can implement selected cloud solutions suitable for identified needs.	K2_IZ_U06
In terms of social competences		
PEU_K01	Responsibly completes tasks at home and in the lab, independently and as part of a team. Is prepared to present the results and to help other students in collaboration.	K2_IZ_K07

Program content ensuring learning outcomes

During the seminar classes, students learn about selected cloud technologies and services from various vendors, global and local, in the context of organizational and business management. They learn about service types and applications, migration processes, strategies, risks, security, reliability and costs.
During the lab classes, students acquire the skills to identify, select, install, configure and deploy cloud services from various vendors.

Calculation of ECTS points

Activity form	**Activity hours**
Laboratory	15
Seminar	15
Conducting literature research	6
Self-study of class topics	6
Preparaton for classes	7
Conducting empirical studies	6
Preparation of a report/summary/presentation/paper	6
Prepararation for an exam/credit	6
Preparation of a project	6
Credit/Exam	2
Student workload	**Hours** 75

Wrocław University of Science and Technology

Research Workshop

Educational subject description sheet

Basic information

Field of study Business Engineering	**Education cycle** 2025/2026
Speciality -	**Subject code** W8NIZZ/000S.34PK.02947.25
Organizational unit Faculty of Management	**Lecture languages** English
Study level second degree 3 semesters	**Mandatoriness** Obligatory
Study form full-time studies	**Block** Major-specific subjects
Education profile general academic profile	**Subject related to scientific research** Yes

Semester	Activities, hours, ECTS and examination
Semester 3	• Seminar: 15 h, 1 ECTS, Graded credit

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Characterizes the methods of scientific research.	K2_IZ_W07, K2_IZ_W09
PEU_W02	Identifies and selects scientific databases that should be the basis for for conducting literature analysis.	K2_IZ_W07, K2_IZ_W09
PEU_W03	Presents and characterizes the structure of a scientific article and the path of its publication.	K2_IZ_W07, K2_IZ_W09
In terms of skills		
PEU_U01	Selects and analyzes literature sources in a structured manner.	K2_IZ_U08, K2_IZ_U22
PEU_U02	Applies research skills, such as formulating and testing of hypotheses related to identified simple research problems.	K2_IZ_U08, K2_IZ_U22
PEU_U03	Selects appropriate methods, techniques and research tools.	K2_IZ_U08, K2_IZ_U22
In terms of social competences		

PEU_K01	Identifies research problems and takes into account the need for their structured solution.	K2_IZ_K01, K2_IZ_K03, K2_IZ_K06
PEU_K02	Proceeds in accordance with the ethics of scientific research during independent critical analysis of literature and research results.	K2_IZ_K01, K2_IZ_K03, K2_IZ_K06

Program content ensuring learning outcomes

The subject aims to develop competence in conducting scientific research and publishing its results. Participants will acquire theoretical and practical knowledge that will enable them to design, implement and describe empirical research. Particular emphasis will be placed on critical analysis of the scientific literature, formulation of research hypotheses, selection of a
research methodology, as well as editing and structuring scientific texts.

Calculation of ECTS points

Activity form	**Activity hours**
Seminar	15
Preparation of a report/summary/presentation/paper	8
Credit/Exam	2
Student workload	**Hours** 25

Wrocław University of Science and Technology

Diploma Thesis

Educational subject description sheet

Basic information

Field of study
Business Engineering

Speciality
Business Intelligence

Organizational unit
Faculty of Management

Study level
second degree 3 semesters

Study form
full-time studies

Education profile
general academic profile

Education cycle
2025/2026

Subject code
W8NIZZ/000BITS.34PK.03706.25

Lecture languages
English

Mandatoriness
Obligatory elective

Block
Major-specific subjects

Subject related to scientific research
Yes

Semester	Activities, hours, ECTS and examination
Semester 3	• Project: 45 h, 12 ECTS, Graded credit

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Integrates knowledge from different areas of management (strategy, finance, human resources, marketing), taking into account current development trends and challenges of the modern business world, in order to develop solutions to real organizational challenges; identifies and defines research problems specific to these areas.	K2_IZ_W07
PEU_W02	Explains and justifies the use of methods of data analysis, qualitative and quantitative research, and modern technologies in the research process to diagnose and improve operations in specific functional areas of the organization.	K2_IZ_W09
In terms of skills		
PEU_U01	Selects appropriate sources and conducts in-depth literature studies; critically and synthetically analyzes the information obtained.	K2_IZ_U07

PEU_U02	Formulates research problems, tests hypotheses, selects adequate methods, techniques and research tools, develops, presents and interprets research results, draws conclusions, indicates directions for further research.	K2_IZ_U22
In terms of social competences		
PEU_K01	Is capable of independently identifying and filling knowledge gaps and developing key skills in response to changing professional requirements; shows initiative in selecting methods and tools to solve problems encountered in professional work, taking into account the specifics the specifics and needs of the organizations studied.	K2_IZ_K03, K2_IZ_K06

Program content ensuring learning outcomes

The purpose of the subject is to develop a dissertation (thesis) on the basis of the knowledge acquired during the studies, in-depth literature surveys, accomplished analytical and design work and the results of research. It is important to set the topic of the work in the broader context of research within the discipline.
Under the supervision of the thesis supervisor, the student consolidates the skills of acquiring and using scientific and technical information, clarifies the research problem and the purpose of the thesis. The student then diagnoses the formulated problem indicating its dysfunctions and possible directions for improvement. Selects methods appropriate to solve/analyze the formulated problem. Develops a professional dissertation in accordance with departmental requirements in close cooperation with the supervisor.

Calculation of ECTS points

Activity form	**Activity hours**
Project	45
Conducting literature research	45
Conducting empirical studies	45
Preparation of a project	45
Preparation of the thesis	100
Prepararation for an exam/credit	20
Student workload	**Hours** 300

Wrocław University of Science and Technology

Foreign Language 2.2

Educational subject description sheet

Basic information

Field of study lektoraty	**Education cycle** 2025/2026
Speciality -	**Subject code** PWRSJOS.97JO.02690.25
Organizational unit Wrocław University of Science and Technology	**Lecture languages** English
Study level second degree	**Mandatoriness** Elective
Study form full-time studies	**Block** Foreign languages
Education profile general academic profile	

Semesters	**Activities, hours, ECTS and examination**
Semester 1, Semester 2, Semester 3	• Classes: 60 h, 3 ECTS, Graded credit

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of skills		
PEU_U01	Student has knowledge, skills and competences consistent with the requirements specified for the appropriate language level; knows, understands and uses linguistic means (grammatical, lexical and stylistic) defined at a certain level from everyday life with selected elements of academic, specialist and technical language used in the field of study and in the academic and professional environment; communicates in a family, social and intercultural environment, practicing communication skills; appreciates the need to improve their skills in effective communication, develops competences in the area of communication language, basics of specialist and academic language	SJO_S2_U01

Program content ensuring learning outcomes

A1; A2; B1 French, Spanish, Japanese, German, Polish as a foreign language, Russian
General educational content
Formation and deepening of communicative competence in a family, social and intercultural environment and for a specific level for academic and professional needs.
Interaction appropriate to the appropriate level of language competence, e.g., the student's own profile and interests; presenting oneself, one's interests and ideas in environmental, academic and professional contexts. Developing creative, receptive and interactive competence in a group.
Language in communication in the modern world. Verbal and non-verbal communication - sensitivity to cultural differences, starting a conversation, joining in a discussion, moving on to the next points, summarizing statements, using characteristic phrases and expressions for a certain language level; taking part in various forms of interaction.

Calculation of ECTS points

Activity form	**Activity hours**
Classes	60
Preparaton for classes	30
Student workload	**Hours** 90

Wrocław University of Science and Technology

Business Ethics and Intellectual Property

Educational subject description sheet

Basic information

Field of study Business Engineering	**Education cycle** 2025/2026
Speciality -	**Subject code** W8NIZZ/000S.34HS.04480.25
Organizational unit Faculty of Management	**Lecture languages** English
Study level second degree 3 semesters	**Mandatoriness** Obligatory
Study form full-time studies	**Block** Subjects from the fields of humanities or social sciences
Education profile general academic profile	

Semester	Activities, hours, ECTS and examination
Semester 3	• Seminar: 30 h, 2 ECTS, Graded credit

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Characterizes, explains and interprets moral and ethical norms and standards specific to the functional areas of organizations related to the specialty studied.	K2_IZ_W07, K2_IZ_W13
PEU_W02	Idnentifies the basic ethical dilemmas of the modern world.	K2_IZ_W13
In terms of skills		
PEU_U01	Uses specialized normative systems in the area of ethics. Justifies and applies appropriate moral and ethical norms and standards in relation to the organization's activities.	K2_IZ_U20
In terms of social competences		
PEU_K01	Acts in accordance with ethical principles. Identifies ethical problems in the business environment.	K2_IZ_K01, K2_IZ_K05, K2_IZ_K07

Program content ensuring learning outcomes

The program content includes issues related to the clarification and interpretation of moral norms and standards, the analysis of the importance and role of ethics in modern business based on selected economic areas (trade, marketing, finance) including: resolving problems related to social responsibility to the environment, showing and analyzing situations in which ethical dilemmas may arise.

Calculation of ECTS points

Activity form	**Activity hours**
Seminar	30
Preparation of a report/summary/presentation/paper	18
Credit/Exam	2
Student workload	**Hours** 50

Wrocław University of Science and Technology

Business Planning

Educational subject description sheet

Basic information

Field of study Business Engineering	**Education cycle** 2025/2026
Speciality -	**Subject code** W8NIZZ/000S.34PO.02952.25
Organizational unit Faculty of Management	**Group of classes** Yes
Study level second degree 3 semesters	**Lecture languages** English
Study form full-time studies	**Mandatoriness** Elective
Education profile general academic profile	**Block** Subjects of general education
	Subject related to scientific research Yes

Semester Semester 3	**Examination** Graded credit **Activities and hours** Lecture: 15 Project: 15	**Number of ECTS points** 2.0

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Identifies methods for analyzing the macro and micro environment and explains the impact of the environment on business operations.	K2_IZ_W06
PEU_W02	Describes sources of financing for business ventures and lists the principles of creating financial forecasts.	K2_IZ_W07
PEU_W03	Describes the legal procedures related to establishing and running a business.	K2_IZ_W13

PEU_W04	Presents the structure and content of a business plan and explains its importance in the process of establishing and developing a business.	K2_IZ_W17
In terms of skills		
PEU_U01	Analyzes and evaluates the impact of the macro- and microeconomic environment on business operations.	K2_IZ_U11, K2_IZ_U12
PEU_U02	Develops a business plan that includes environmental analysis, a marketing strategy, and a financial forecast.	K2_IZ_U13, K2_IZ_U14
PEU_U03	Analyzes the financial needs of the enterprise and plans sources of financing for the venture.	K2_IZ_U21
PEU_U04	Applies knowledge of legal regulations and provisions to establish a business.	K2_IZ_U11
In terms of social competences		
PEU_K01	Is open to teamwork during the preparation and presentation of a business plan.	K2_IZ_K02
PEU_K02	Acts in accordance with professional ethics in the context of business planning.	K2_IZ_K07

Program content ensuring learning outcomes

Students will be prepared to develop business plans. The subject program combines theory with practice, providing participants with essential tools for analyzing and planning business activities. The classes will cover key legal aspects of running a business, as well as techniques for analyzing the macro environment and competition. Students will assess the potential of a business, analyze financial statements, and interpret financial indicators. The course also includes topics related to planning marketing activities and securing sources of financing for business projects. By the end of the subject, participants will gain knowledge on implementing business plans.

Calculation of ECTS points

Activity form	**Activity hours**
Lecture	15
Project	15
Preparation of a project	8
Preparaton for classes	2
Preparation of a report/summary/presentation/paper	4
Prepararation for an exam/credit	4
Credit/Exam	2
Student workload	**Hours** 50

Wrocław University of Science and Technology

Business Models in Developing Environment

Educational subject description sheet

Basic information

Field of study Business Engineering	**Education cycle** 2025/2026
Speciality -	**Subject code** W8NIZZ/000S.34PO.02953.25
Organizational unit Faculty of Management	**Group of classes** Yes
Study level second degree 3 semesters	**Lecture languages** English
Study form full-time studies	**Mandatoriness** Elective
Education profile general academic profile	**Block** Subjects of general education
	Subject related to scientific research Yes

Semester Semester 3	**Examination** Graded credit **Activities and hours** Lecture: 15 Project: 15	**Number of ECTS points** 2.0

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Identifies inter-organizational relations and interactions of an organization with the environment in the context of national, international and intercultural conditions. Explains and illustrates the impact of the environment on the activities of the organization.	K2_IZ_W06, K2_IZ_W07, K2_IZ_W13, K2_IZ_W17
PEU_W02	Describes organization and functioning of the company in the field of strategic management, logistics, marketing, finance, business architecture.	K2_IZ_W06, K2_IZ_W07, K2_IZ_W13, K2_IZ_W17
PEU_W03	Explains the norms and standards (economic, legal, organizational and ethical) that determine the context of the functioning of the economy and organization.	K2_IZ_W06, K2_IZ_W07, K2_IZ_W13, K2_IZ_W17

In terms of skills		
PEU_U01	Is able to analyze and evaluate the objectives, features, elements, processes, functional areas in the enterprise as well as internal and inter-organizational relations, using concepts and theoretical approaches in the field of social sciences, in particular the discipline of management and quality science.	K2_IZ_U11, K2_IZ_U12, K2_IZ_U13, K2_IZ_U14, K2_IZ_U21
PEU_U02	Is able to formulate innovative alternative solutions to management and substantive problems in the enterprise. He can justify, make a choice and verify them in accordance with the established priorities. Can plan actions to solve them.	K2_IZ_U11, K2_IZ_U12, K2_IZ_U13, K2_IZ_U14, K2_IZ_U21
In terms of social competences		
PEU_K01	Is aware of the need for an independent, critical assessment of the scope and level of their knowledge of establishing and running a business Is prepared to independently search for areas of knowledge to supplement and skills to improve.	K2_IZ_K02, K2_IZ_K07

Program content ensuring learning outcomes

The aim of the subject is to provide knowledge about analyzing an organization’s environment and its impact on selecting an appropriate business model. Participants will explore various business models, their classifications, and tools like the lean canvas for creating innovative strategies, especially in the context of startups. The subject also covers principles for designing business models and implementing sustainable development in companies through suitable business models.

Calculation of ECTS points

Activity form	**Activity hours**
Lecture	15
Project	15
Preparation of a project	8
Preparaton for classes	5
Prepararation for an exam/credit	5
Credit/Exam	2
Student workload	**Hours** 50

Wrocław University of Science and Technology

Business Psychology

Educational subject description sheet

Basic information

Field of study
Business Engineering

Speciality
-

Organizational unit
Faculty of Management

Study level
second degree 3 semesters

Study form
full-time studies

Education profile
general academic profile

Education cycle
2025/2026

Subject code
W8NIZZ/000S.34PO.02949.25

Lecture languages
English

Mandatoriness
Elective

Block
Subjects of general education

Subject related to scientific research
Yes

Semester	Activities, hours, ECTS and examination
Semester 3	• Seminar: 30 h, 2 ECTS, Graded credit

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Identifies psychological factors that are important in developing the ability of organizational members to cooperate with the external environment.	K2_IZ_W06
PEU_W02	Characterizes the norms and standards of organizational performance in various economic conditions. Explains the individual and organizational factors that support compliance with these norms.	K2_IZ_W13
PEU_W03	Explains the relevance of short- and long-term plans in an organization in the context of managing employee potential.	K2_IZ_W07
PEU_W04	Describes the internal dynamics of enterprise functioning on the basis of interpersonal interactions. Explains the individual characteristics that predispose people to develop and conduct individual entrepreneurship.	K2_IZ_W17
In terms of skills		

PEU_U01	Identifies factors from the organization's environment that affect employee job motivation, satisfaction and commitment.	K2_IZ_U11
PEU_U02	Identifies psychological factors contributing to effective management of people in project tasks and effective organizational leadership.	K2_IZ_U21
PEU_U03	Combines various personnel management tools to develop a long-term action plan.	K2_IZ_U13
PEU_U04	Analyzes factors affecting the quality of labor relations based on social science models.	K2_IZ_U12
PEU_U05	Adapts tools for resolving employee conflicts and management problems to motivate and increase job satisfaction.	K2_IZ_U14
In terms of social competences		
PEU_K01	Effectively and empathetically communicates with others, respecting different perspectives and worldviews.	K2_IZ_K02
PEU_K02	He effectively presents his own views and can argue in their defense. Is prepared to persuade and negotiate to achieve common goals.	K2_IZ_K07

Program content ensuring learning outcomes

During the seminar, students will explore a range of psychological and organisational topics aimed at understanding and improving workplace dynamics. Students will learn how personality traits affect job performance and how different cognitive, emotional and workload demands affect employees' ability to meet job expectations. Sessions will cover motivational factors, including the impact of attitudes, values and job satisfaction on organisational loyalty, and the interplay of social climate, fairness and relationship quality on overall performance. Students will also look at team building, exploring group dynamics, diversity and factors that support effective collaboration. Other topics include the ethics of decision-making, leadership emergence, employee well-being and workplace bullying. Through the seminars, students will gain practical information on how to foster a healthier, more productive and ethical working environment.

Calculation of ECTS points

Activity form	**Activity hours**
Seminar	30
Preparation of a report/summary/presentation/paper	10
Preparaton for classes	3
Preparation of a project	5
Credit/Exam	2
Student workload	**Hours** 50

Wrocław University of Science and Technology

Corporate Social Responsibility

Educational subject description sheet

Basic information

Field of study Business Engineering	**Education cycle** 2025/2026
Speciality -	**Subject code** W8NIZZ/000S.34PO.02692.25
Organizational unit Faculty of Management	**Group of classes** Yes
Study level second degree 3 semesters	**Lecture languages** English
Study form full-time studies	**Mandatoriness** Elective
Education profile general academic profile	**Block** Subjects of general education
	Subject related to scientific research Yes

Semester Semester 3	**Examination** Graded credit **Activities and hours** Lecture: 15 Seminar: 15	**Number of ECTS points** 2.0

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Defines and explains the basic concepts and theoretical frameworks related to CSR, including its significance in national, international, and intercultural contexts.	K2_IZ_W06
PEU_W02	Describes and compares various approaches to implementing CSR in the areas of the marketplace, workplace, local communities, and environmental protection, explaining how CSR strategies can support entrepreneurship by creating social and economic value.	K2_IZ_W07, K2_IZ_W17
PEU_W03	Identifies and justifies the importance of norms, standards, and ethical aspects of CSR in the context of contemporary societal challenges.	K2_IZ_W13

In terms of skills		
PEU_U01	Analyzes the causes and dynamics of changes in the organization's environment in relation to CSR strategies and their impact on internal and external stakeholders.	K2_IZ_U11, K2_IZ_U12
PEU_U02	Evaluates the current CSR portfolio for a selected company, designs a CSR strategy proposing innovative solutions aligned with the organization's established priorities, using tools such as the Shared Value Virtuous Cycle, Theory of Change, and Outcomes Map.	K2_IZ_U13, K2_IZ_U14
PEU_U03	Interprets the impact of legal and economic regulations on the development and implementation of CSR strategies within a company.	K2_IZ_U21
In terms of social competences		
PEU_K01	Collaborates with a project team, taking on various roles in the process of developing and presenting CSR strategies.	K2_IZ_K02
PEU_K02	Demonstrates initiative in identifying social and environmental issues related to the company's activities, proposing elements for the CSR portfolio in alignment with ethical principles.	K2_IZ_K07

Program content ensuring learning outcomes

The aim of the subject is to familiarize students with aspects of corporate social responsibility, also in the context of problems and challenges of corporate social responsibility in relations with various stakeholder groups. The course covers key topics related to Corporate Social Responsibility (CSR), including its fundamental principles, main actors, and pillars. Students will explore practical aspects of CSR implementation in various areas of business operations, such as the market, workplace, local community, and natural environment. Strategies for supporting social and economic value creation through entrepreneurship, as well as CSR management and reporting, will be discussed. The course also includes an analysis of CSR implementation case studies, audits, and self-regulation in the context of partnerships. Students will have the opportunity to apply their knowledge through practical case studies and the development of CSR strategies for selected organizations.

Calculation of ECTS points

Activity form	**Activity hours**
Lecture	15
Seminar	15
Preparation of a report/summary/presentation/paper	10
Prepararation for an exam/credit	8
Credit/Exam	2
Student workload	**Hours** 50

Wrocław University of Science and Technology

Ethics of New Technologies

Educational subject description sheet

Basic information

Field of study Business Engineering	**Education cycle** 2025/2026
Speciality -	**Subject code** W8NIZZ/000S.34HS.02955.25
Organizational unit Faculty of Management	**Group of classes** Yes
Study level second degree 3 semesters	**Lecture languages** English
Study form full-time studies	**Mandatoriness** Elective
Education profile general academic profile	**Block** Subjects from the fields of humanities or social sciences

Semester Semester 3	**Examination** Graded credit **Activities and hours** Lecture: 15 Seminar: 15	**Number of ECTS points** 2.0

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Identifies and explains decision-making processes related to technology governance	K2_IZ_W12
PEU_W02	Identifies regulatory and other non-technical standards of the technology assessment process. Characterizes them in the context of the dilemmas of modern civilization.	K2_IZ_W13
In terms of skills		
PEU_U01	Is able to use knowledge of regulations regarding technology assessment, technology governance and principles of professional ethics to analyze socio-economic phenomena and to solve problems at the organizational level.	K2_IZ_U20

In terms of social competences		
PEU_K01	Accepts and appreciates the need to solve social and organizational problems in the deliberative process, recognizing the knowledge and opinions of experts. Is oriented towards acting in the public interest.	K2_IZ_K05
PEU_K02	Appreciates the importance of the principles of professional ethics and is ready to seek appropriate solutions in the event of a disagreement, conflict or an ethical dilemma.	K2_IZ_K07

Program content ensuring learning outcomes

The subject explains core ethical concepts and theories and identifies and explains the distinction between ethical and legal regulations.
The classes content includes: presentation of technology assessment as a theoretical field and multidisciplinary practice, principles of technology assessment and communicating its results, ethical and social conditions of performing technical activities. The subject develops the ability to apply applicable regulations and rules. By completing structured assignments, students also acquire the competence to make decisions in a group process and communicate it to the public.

Calculation of ECTS points

Activity form	Activity hours
Lecture	15
Seminar	15
Preparation of a report/summary/presentation/paper	5
Self-study of class topics	5
Preparaton for classes	3
Conducting literature research	3
Self-development of practical skills	2
Credit/Exam	2
Student workload	**Hours** 50

Wrocław University of Science and Technology

Ethic of Management and New Technologies

Educational subject description sheet

Basic information

Field of study Business Engineering	**Education cycle** 2025/2026
Speciality -	**Subject code** W8NIZZ/000S.34HS.02956.25
Organizational unit Faculty of Management	**Group of classes** Yes
Study level second degree 3 semesters	**Lecture languages** English
Study form full-time studies	**Mandatoriness** Elective
Education profile general academic profile	**Block** Subjects from the fields of humanities or social sciences

Semester Semester 3	**Examination** Graded credit **Activities and hours** Lecture: 15 Seminar: 15	**Number of ECTS points** 2.0

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Identifies, recognises, explains and describes the ethical, humanistic and social conditions of contemporary economic, political and civic organisations in the context of new technologies.	K2_IZ_W12, K2_IZ_W13
PEU_W02	Identifies and characterises the key ethical dilemmas of contemporary civilisation, especially in the context of new technologies.	K2_IZ_W12, K2_IZ_W13
In terms of skills		
PEU_U01	Analyses and ethically evaluates possible dilemmas related to new technologies, their management and implementation. Develops, argues and prepares possible solutions.	K2_IZ_U20

PEU_U02	Demonstrates the ethical consequences associated with new technologies, their management and implementation, and conducts a discussion on these consequences.	K2_IZ_U20
In terms of social competences		
PEU_K01	Is able to initiate changes in the organisation and participates in their planning and implementation. Is capable of anticipating the multidirectional effects of the changes implemented. Is able to think and act in an entrepreneurial manner and is sensitive to and initiates action for the public interest.	K2_IZ_K05
PEU_K02	Is able to courageously communicate and defend his/her own views. Demonstrates initiative to persuade and negotiate for the sake of achieving goals accorting to the principles of ethics.	K2_IZ_K07

Program content ensuring learning outcomes

The aim of the subject is to present the social, philosophical, and ethical aspects of engineering and managerial activities and to show the problem of social responsibility of such fields as science and technology, especially in the context of the development of new technologies.
To present basic knowledge of ethics, its history and the most important ethical theories and their links to moral dilemmas as well as issues of contemporary technological and managerial development.
To raise awareness of the necessity of individual and team activity beyond engineering, especially in the context of ethical dilemmas.

Calculation of ECTS points

Activity form	**Activity hours**
Lecture	15
Seminar	15
Preparaton for classes	4
Preparation of a report/summary/presentation/paper	4
Prepararation for an exam/credit	4
Self-study of class topics	6
Credit/Exam	2
Student workload	**Hours** 50

Wrocław University of Science and Technology

Historical and Modern Perspectives of Leadership

Educational subject description sheet

Basic information

Field of study Business Engineering	**Education cycle** 2025/2026
Speciality -	**Subject code** W8NIZZ/000S.34HS.04481.25
Organizational unit Faculty of Management	**Group of classes** Yes
Study level second degree 3 semesters	**Lecture languages** English
Study form full-time studies	**Mandatoriness** Elective
Education profile general academic profile	**Block** Subjects from the fields of humanities or social sciences

Semester Semester 3	**Examination** Graded credit **Activities and hours** Lecture: 15 Seminar: 15	**Number of ECTS points** 2.0

Subject's learning outcomes

Subject's outcome	Content	Learning outcome
In terms of knowledge		
PEU_W01	Classifies leadership theories and models in terms of classical and modern approaches to analyzing and measuring leadership	K2_IZ_W12, K2_IZ_W13
In terms of skills		
PEU_U01	Has the ability to take the role of a team leader, deal with conflicts, time pressure and other responsibility systems	K2_IZ_U20
In terms of social competences		
PEU_K01	Communicates effectively and empathetically with others while respecting different perspectives	K2_IZ_K05, K2_IZ_K07

Program content ensuring learning outcomes

During lectures, students will learn about the evolution of leadership in different historical periods and theoretical perspectives. They will begin by learning about leadership in ancient civilizations, analyzing the roles of pharaohs, Roman emperors and Confucian scholars. Moving through the medieval era and the Enlightenment period, students will delve into theories of leadership, beginning with the great man theory, which views leadership as an innate trait, and then moving on to behavioral, situational and contingent models, which emphasize adaptability and context. Contemporary perspectives include transformational and transactional leadership, emphasizing their importance in modern organizations. Finally, students learn about global leadership, comparing leadership styles in different cultural and geopolitical contexts, equipping them with a broader understanding of leadership in today's interconnected world.
During the seminars, students will engage in discussions and analyses of various leadership concepts and their contemporary relevance. They will start by exploring the modern applications of ancient leadership philosophies, examine how religion and the Church shaped leadership styles and authority structures and Enlightenment ideas on authority. Further, students will delve into behavioral leadership theories, comparing authoritarian, democratic, and laissez-faire leadership styles. They will also critically assess the role of values, integrity, and ethics in leadership, considering their impact on decision-making and organizational culture, destructive leadership, including abusive supervision and narcissistic leadership, exploring its consequences for organizations and strategies for prevention and intervention. Finally, students will reflect on the challenges facing future leaders, discussing the evolving demands of leadership in an increasingly complex and dynamic global environment.

Calculation of ECTS points

Activity form	**Activity hours**
Lecture	15
Seminar	15
Credit/Exam	2
Self-study of class topics	5
Preparation of a report/summary/presentation/paper	5
Preparaton for classes	4
Prepararation for an exam/credit	4
Student workload	**Hours** 50