



Lodz University  
of Technology

# Study programme

|                        |                                                                          |
|------------------------|--------------------------------------------------------------------------|
| <b>Faculty:</b>        | Faculty of Civil Engineering, Architecture and Environmental Engineering |
| <b>Major:</b>          | Civil Engineering                                                        |
| <b>Level of study:</b> | second-cycle programme (magister inżynier)                               |
| <b>Form of study:</b>  | part-time studies                                                        |
| <b>Academic year:</b>  | 2026/27                                                                  |

# Table of contents

|                                                                                  |    |
|----------------------------------------------------------------------------------|----|
| Basic information                                                                | 3  |
| Learning outcomes (in relation to the PQF)                                       | 4  |
| Matrix of course modules in relation to learning outcomes and curriculum content | 5  |
| ECTS - subjects                                                                  | 8  |
| ECTS indicators                                                                  | 10 |
| Methods of verifying and assessing learning outcomes                             | 11 |
| Professional internships                                                         | 12 |
| Specializations/degree paths offered within the study program                    | 13 |
| Characteristics of the course                                                    | 14 |
| Education program                                                                | 16 |

## Basic information

|                                                                                                                                                                  |                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Name of the field of study:                                                                                                                                      | Civil Engineering                          |
| Level of study:                                                                                                                                                  | second-cycle programme (magister inżynier) |
| Study profile:                                                                                                                                                   | general academic                           |
| Form of studies:                                                                                                                                                 | part-time studies                          |
| Duration of studies (number of semesters):                                                                                                                       | 4                                          |
| The number of ECTS points required to complete studies:                                                                                                          | 90                                         |
| Total number of hours of classes:                                                                                                                                | 665                                        |
| The number of ECTS points a student obtains as part of classes conducted with the direct participation of academic teachers or other persons conducting classes: | 26                                         |
| Professional title awarded to graduates:                                                                                                                         | magister inżynier                          |
| ISCED code:                                                                                                                                                      | 0732                                       |
| Language of study:                                                                                                                                               | polish                                     |

### Assigning the course to the disciplines to which the learning outcomes relate

| Discipline                      | Percentage share |
|---------------------------------|------------------|
| Civil engineering and transport | 100%             |

## Learning outcomes (in relation to the PQF)

| No. | Learning outcome code | Learning Outcome Content                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Reference to the universal characteristics of the first level of PRK | Reference to the second-level characteristics of the PRK, taking into account the second-level characteristics enabling the acquisition of engineering competences |
|-----|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | 2BUD1                 | knows und understands knowledge of mathematics, computer science and mechanics to a degree that enables solving complex engineering problems in civil engineering, and explain the methodology of scientific research                                                                                                                                                                                                                                                                                       | P7U_W                                                                | P7S_WG                                                                                                                                                             |
| 2   | 2BUD10                | is ready to adheres to the principles of professional ethics and takes responsibility for the actions undertaken                                                                                                                                                                                                                                                                                                                                                                                            | P7U_K                                                                | P7S_KO, P7S_KR                                                                                                                                                     |
| 3   | 2BUD2                 | knows und understands advanced issues related to the design and assessment of buildings in accordance with the principles of building physics, the issues of the impact of buildings on the environment over their entire life cycle, and the selection of building materials and technologies in line with the principles of sustainable development                                                                                                                                                       | P7U_W                                                                | P7S_WG, P7S_WK, P7S_WG_inž                                                                                                                                         |
| 4   | 2BUD3                 | knows und understands advanced issues related to the design of building structures and knows the principles and methods for assessing the technical condition of existing buildings                                                                                                                                                                                                                                                                                                                         | P7U_W                                                                | P7S_WG, P7S_WG_inž                                                                                                                                                 |
| 5   | 2BUD4                 | knows und understands advanced issues of technology and organization of the construction process, including digital technologies in the planning and implementation of a construction project (BIM methodology) and the principles of quality management and risk analysis of construction projects, methods of management in construction, including leading teams and a construction company, and identifies the basic principles of creating and developing various forms of individual entrepreneurship | P7U_W                                                                | P7S_WK, P7S_WK_inž                                                                                                                                                 |
| 6   | 2BUD5                 | is able to formulates and solves problems in the field of civil engineering by selecting and applying appropriate methods and tools, and creatively interprets and presents the obtained results                                                                                                                                                                                                                                                                                                            | P7U_U                                                                | P7S_UW, P7S_UW_inž                                                                                                                                                 |
| 7   | 2BUD6                 | is able to solves complex problems in the field of structural design as well as the design of construction technology and organization, performs technical assessments of buildings and engineering structures, and critically analyzes existing technical solutions                                                                                                                                                                                                                                        | P7U_U                                                                | P7S_UW, P7S_UW_inž                                                                                                                                                 |
| 8   | 2BUD7                 | manages a complex construction process and leads teams of people, discusses specialist topics, also in a foreign language at B2+ level, while caring for professional development and continuous knowledge updating through lifelong learning                                                                                                                                                                                                                                                               | P7U_U                                                                | P7S_UW, P7S_UK, P7S_UO, P7S_UU, P7S_UW_inž                                                                                                                         |
| 9   | 2BUD8                 | is able to develop and implement research programs, select building materials in accordance with sustainable development principles, and participate in the testing and evaluation of construction products                                                                                                                                                                                                                                                                                                 | P7U_U                                                                | P7S_UW, P7S_UK, P7S_UU, P7S_UW_inž                                                                                                                                 |
| 10  | 2BUD9                 | is ready to recognizes the importance of knowledge in solving cognitive and practical problems, and respects the diversity of views and cultures                                                                                                                                                                                                                                                                                                                                                            | P7U_K                                                                | P7S_KK                                                                                                                                                             |

## Matrix of course modules in relation to learning outcomes and curriculum content

| No. | Course name                                        | Program content                                                                                                                                                                                                                                                                                                                                                                                                                           | 2BUD1 | 2BUD10 | 2BUD2 | 2BUD3 | 2BUD4 | 2BUD5 | 2BUD6 | 2BUD7 | 2BUD8 | 2BUD9 |
|-----|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1   | Theory of Elasticity and Plasticity                | Tensor algebra, tensor analysis, continuum mechanics, Hooke's law, boundary value problem, Ritz and Galerkin methods, theory of elasticity, thin plate theory.                                                                                                                                                                                                                                                                            | x     |        |       |       |       | x     |       |       |       |       |
| 2   | Structural Reliability                             | Standardization issues, structural reliability according to first-order theory, expected values and standard deviations, Monte Carlo simulation method, second-order second-moment perturbation method, analytical methods.                                                                                                                                                                                                               |       |        |       | x     |       |       |       |       |       |       |
| 3   | Special Foundations                                | Diploma regulations, methodology for preparing the diploma thesis, individual thesis presentations and the rules and procedures for the competency exam, including topics preparing for the exam.                                                                                                                                                                                                                                         |       |        |       | x     |       | x     | x     |       |       |       |
| 4   | Thermo-Renovation to Sustainable Building Standard | Basic concepts related to sustainable development and the environmental impact of buildings. Analysis of thermal comfort and daylight availability in rooms. Basic concepts of thermal modernization. The progression of hygrothermal phenomena in buildings undergoing modernization, along with various methods and technologies used to improve the energy performance of buildings.                                                   |       | x      | x     |       |       |       | x     |       |       |       |
| 5   | Structural Mechanics                               | Advanced computational methods used in structural mechanics. Advanced issues in the stability of bar systems. Stability of plates. Advanced topics in structural dynamics. Equilibrium issues of shells.                                                                                                                                                                                                                                  | x     |        | x     |       |       | x     |       |       |       |       |
| 6   | Advanced Steel Structures                          | Principles of shaping and dimensioning industrial hall structures, including load-bearing systems, bracing, roof coverings, and elements interacting with horizontal transport, as well as the design of sheds and lattice towers. Design and verification of steel elements, connections, and foundations, considering actions, stability, fatigue, and standard requirements.                                                           |       |        |       | x     |       | x     |       |       |       |       |
| 7   | Durability of Structures and Materials             | Identification of corrosion hazards for structures and materials. Designing corrosion protection for structures and materials. Performing laboratory corrosion testing of building materials.                                                                                                                                                                                                                                             |       |        | x     | x     |       |       |       |       | x     |       |
| 8   | Building Renovation and Heritage Conservation      | Determining the technical wear and tear of building structures. Principles of diagnostics for building structures. Repair technology for timber and masonry structural elements. Historical methods of dimensioning structural elements, building regulations, and design standards. Fundamentals of the theory of conservation and heritage protection of building structures from the beginning of the 19th century to the present day. |       |        |       | x     |       |       |       |       |       |       |
| 9   | Advanced Concrete Structures                       | Design and detailing of reinforcement for reinforced concrete slabs and walls. Shaping and design of reinforced concrete tanks, determination of loads acting on this type of structures.                                                                                                                                                                                                                                                 |       |        |       | x     |       | x     |       |       |       |       |
| 10  | Modern Wooden Structures                           | Modern timber structures and wood-based materials. Design guidelines and example solutions for complex timber structures. Fire safety of timber structures.                                                                                                                                                                                                                                                                               |       |        |       | x     |       | x     |       |       |       |       |

| No. | Course name                                                 | Program content                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2BUD1 | 2BUD10 | 2BUD2 | 2BUD3 | 2BUD4 | 2BUD5 | 2BUD6 | 2BUD7 | 2BUD8 | 2BUD9 |
|-----|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| 11  | Building Information Modeling                               | Utilization of IT tools in BIM technology and coordination of architectural projects within interdisciplinary teams. Modeling of terrain and infrastructure in the BIM environment. Development of schedules, construction simulations, and cost estimates, as well as performing energy analyses. Introduction to parametric design and data integration in the digital model.                                                                                                                   | x     |        |       |       | x     |       | x     | x     |       |       |
| 12  | Renewable Energy Systems                                    | Basic renewable energy systems. Fundamental concepts related to renewable energy sources. Principles of energy calculations for RES systems.                                                                                                                                                                                                                                                                                                                                                      |       |        |       |       |       |       |       |       | x     |       |
| 13  | Strengthening of Structures and Subsoil                     | Techniques and design methods for strengthening steel and reinforced concrete structures as well as subsoil.                                                                                                                                                                                                                                                                                                                                                                                      |       |        |       | x     |       | x     | x     |       |       |       |
| 14  | Project Management                                          | Preparation of an investment for implementation. Preparation of tender specifications, project schedules, and cost estimation. Preparation of investment budgets, risk management, and negotiation of construction contract provisions. Preparation of material technical data sheets, quality control plans, and change management.                                                                                                                                                              |       | x      |       |       | x     |       |       | x     |       |       |
| 15  | Building Acoustics                                          | Basic acoustic phenomena in building structures. Calculation of acoustic parameters in buildings and rooms applying current building standards and regulations.                                                                                                                                                                                                                                                                                                                                   |       |        | x     |       |       |       |       |       | x     |       |
| 16  | Design and Modernization of Roads and Bridges               | Design of roads and bridge structures, including concrete and prestressed, slab, beam, arch, and cable-stayed structures, along with their construction technology. Causes of degradation and typical damages of bridge and road structures, principles of their maintenance, diagnostics, and monitoring. Methods of repair, renovation, strengthening, and structural modernization.                                                                                                            |       |        |       | x     |       |       |       |       |       |       |
| 17  | Foreign Language for Specialist Purposes                    | Analysis of scientific texts; critical reading of authentic materials. Synthesis of information from various sources. Rules for creating scientific texts and scientific presentations. Describing concepts, phenomena and processes; interpreting research results/statistical data. Scientific presentations: forms, signposting/signalling/call for action, body language and presentation techniques. Reflection, self-assessment and lifelong learning in a scientific and industry context. |       |        |       |       |       |       |       | x     |       |       |
| 18  | Economics and Entrepreneurship                              | Social, environmental, economic, legal, and other non-technical conditions of engineering activities in the field of civil engineering. Life cycle analysis of equipment, facilities, and systems, protection of industrial property and copyright, building law, and environmental protection. Basic principles of creating and developing various forms of entrepreneurship.                                                                                                                    |       | x      |       |       | x     |       |       |       |       | x     |
| 19  | Technical and Environmental Aspects of Building Maintenance | Basic issues concerning the maintenance of buildings. Assessment of the technical condition and methods of assessing the technical condition of buildings. Penalties for improper maintenance of buildings. Poor technical condition as a cause of building disasters. Building disasters related to unusual natural phenomena and other random events.                                                                                                                                           |       | x      |       |       | x     |       | x     | x     |       |       |

| No. | Course name                                         | Program content                                                                                                                                                                                                                                                                                                | 2BUD1 | 2BUD10 | 2BUD2 | 2BUD3 | 2BUD4 | 2BUD5 | 2BUD6 | 2BUD7 | 2BUD8 | 2BUD9 |
|-----|-----------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|
| 20  | Diploma Seminar                                     | Selected types of special foundations and their design methods, selected methods of ground modification, selected constitutive models of soils and their parameterization, soil-structure interaction issues, and numerical methods in the analysis of geotechnical problems.                                  | x     |        |       |       |       |       | x     |       | x     |       |
| 21  | Final Project                                       | Individual development and solution of a research problem carried out as part of a master's thesis covering issues in the field of civil engineering and related disciplines. Preparation of a written report presenting the process of solving the research problem and presentation of the results obtained. | x     |        |       |       |       |       | x     |       | x     | x     |
| 22  | Computer-Aided Structural Optimization              | Theory of elasticity and the Finite Element Method in the analysis of engineering structures. Numerical modeling of reinforced concrete and steel elements and verification of limit states. Introduction to sensitivity analysis and structural optimization using computational tools and parametric design. | x     |        | x     |       |       | x     |       |       |       |       |
| 23  | Prestressed Structures                              | Design of prestressed structures in pre-tensioned and post-tensioned concrete technology, including execution aspects.                                                                                                                                                                                         |       |        |       | x     |       |       | x     |       |       |       |
| 24  | Design and Modeling of Advanced Concrete Structures | Design of advanced building structures, such as high-rise buildings and reinforced concrete frame structures, using computer modeling tools.                                                                                                                                                                   |       |        |       | x     |       | x     |       |       | x     |       |
| 25  | Steel Industrial Structures                         | Steel chimneys, steel masts and their purposes, tanks and silos, bunkers and silos, cable-supported structures.                                                                                                                                                                                                |       |        |       | x     |       |       | x     |       |       |       |

## ECTS - subjects

| No. | Course name                                                 | ECTS | Subjects in the field of humanities and social sciences | Elective subjects | Profile items | Classes in a foreign language |
|-----|-------------------------------------------------------------|------|---------------------------------------------------------|-------------------|---------------|-------------------------------|
| 1   | Theory of Elasticity and Plasticity                         | 3    |                                                         |                   |               |                               |
| 2   | Structural Reliability                                      | 2    |                                                         |                   | 2             |                               |
| 3   | Special Foundations                                         | 4    |                                                         |                   | 4             | 4                             |
| 4   | Thermo-Renovation to Sustainable Building Standard          | 4    |                                                         |                   | 4             |                               |
| 5   | Structural Mechanics                                        | 4    |                                                         |                   | 4             |                               |
| 6   | Advanced Steel Structures                                   | 5    |                                                         |                   | 5             |                               |
| 7   | Durability of Structures and Materials                      | 4    |                                                         | 4                 | 4             |                               |
| 8   | Building Renovation and Heritage Conservation               | 5    |                                                         | 5                 |               |                               |
| 9   | Advanced Concrete Structures                                | 6    |                                                         |                   | 6             |                               |
| 10  | Modern Wooden Structures                                    | 4    |                                                         |                   | 4             |                               |
| 11  | Building Information Modeling                               | 3    |                                                         |                   | 3             |                               |
| 12  | Renewable Energy Systems                                    | 2    |                                                         | 2                 |               |                               |
| 13  | Strengthening of Structures and Subsoil                     | 6    |                                                         | 6                 |               |                               |
| 14  | Project Management                                          | 2    |                                                         |                   |               |                               |
| 15  | Building Acoustics                                          | 3    |                                                         |                   | 3             |                               |
| 16  | Design and Modernization of Roads and Bridges               | 3    |                                                         |                   |               |                               |
| 17  | Foreign Language for Specialist Purposes                    | 2    |                                                         |                   |               |                               |
| 18  | Economics and Entrepreneurship                              | 3    | 3                                                       |                   |               |                               |
| 19  | Technical and Environmental Aspects of Building Maintenance | 3    | 3                                                       |                   | 3             |                               |
| 20  | Diploma Seminar                                             | 2    |                                                         |                   |               |                               |
| 21  | Final Project                                               | 20   |                                                         | 20                | 20            |                               |

| No. | Course name                                         | ECTS | Subjects in the field of humanities and social sciences | Elective subjects | Profile items | Classes in a foreign language |
|-----|-----------------------------------------------------|------|---------------------------------------------------------|-------------------|---------------|-------------------------------|
| 22  | Computer-Aided Structural Optimization              | 5    |                                                         | 5                 | 5             |                               |
| 23  | Prestressed Structures                              | 4    |                                                         | 4                 |               |                               |
| 24  | Design and Modeling of Advanced Concrete Structures | 5    |                                                         | 5                 | 5             |                               |
| 25  | Steel Industrial Structures                         | 3    |                                                         | 3                 |               |                               |

# ECTS indicators

| Name                                                                                                                                                                                                                            | brak           | brak           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|----------------|
| The total number of ECTS credits that a student must obtain through elective courses (amounting to no less than 30% of the total ECTS credits required to obtain the qualification corresponding to the given level of study)   | 37/90 (41.11%) | 37/90 (41.11%) |
| The total number of ECTS credits to be earned by a student through courses in the fields of humanities or social sciences                                                                                                       | 6              | 6              |
| The total number of ECTS credits that a student must obtain from courses related to research conducted at the university, amounting to more than 50% of the total ECTS credits required to graduate from a given level of study | 62/90 (68.89%) | 68/90 (75.56%) |

## Methods of verifying and assessing learning outcomes

The verification of achieved learning outcomes requires the use of diverse assessment methods appropriate to the categories of knowledge, skills, and social competencies to which these outcomes pertain. The selection of suitable tools also depends on the specific nature of the subject and the format of the classes and is described in detail in the course syllabi. The achievement of the required learning outcomes is assessed through:

1. Written assignments (exams, quizzes, reports, essays, projects, posters, thesis, etc.);
2. Oral assessments (oral exams, public speaking, e.g., delivering a paper, presentation, etc.);
3. Practical and/or project-based tasks (both individual and group work);
4. Observation and evaluation of students' participation and activity during classes;
5. Self-assessment and peer evaluation (especially in the case of group projects);
6. Competency exams and final diploma examinations.

Verification can be formative (partial, conducted multiple times during the course) and/or summative (final grade assessment). The final verification result is given according to the currently applicable grading scale.

The course coordinator or instructor is required to present the course syllabus during the first class and to clearly define and formally communicate the assessment methods and conditions for verifying learning outcomes.

**Professional internships**

N/A

## **Specializations/degree paths offered within the study program**

brak

brak

# Characteristics of the course

## Graduate profile

A graduate of second-cycle (master's) studies in Civil Engineering possesses advanced theoretical knowledge and practical skills in the fields of design, construction technology and organization of construction processes, as well as the operation and maintenance of engineering structures. They are prepared to independently solve complex engineering problems, lead design teams, and supervise the implementation of projects across various sectors of the construction industry.

Graduates may find employment in design offices, construction companies, public administration units, research institutes, as well as consulting and expert firms. The qualifications obtained enable them to apply for licenses to perform independent technical functions in construction in a full scope, after completing the required professional internship. Therefore, the curriculum content is consulted with the Łódź Regional Chamber of Civil Engineers as a representative of the professional community.

Thanks to the competencies acquired in computational methods, modern construction technologies, and investment process management, graduates are prepared to undertake advanced engineering and decision-making tasks in diverse construction projects, as well as to conduct scientific research and continue their education in third-cycle (doctoral) studies.

## The relationship between the field of study and the university's strategy

The implementation of the second-cycle (master's) study program in Civil Engineering at Lodz University of Technology provides an advanced and specialized response to the objectives set out in the University's mission and strategy for 2025–2030, which are oriented toward the development of a modern research university closely cooperating with the socio-economic environment. Education at the master's level strengthens the role of the University as an institution that develops talents, competencies, and technologies, constituting an important element in building its position as a valued partner for the economy and public institutions.

Within the strategic area of EDUCATION, the second-cycle program focuses on developing advanced engineering, research, and managerial competencies, using modern teaching methods, including project-based learning, teamwork, and elements of lifelong learning. This enables the individualization of educational paths, strengthens talent management processes, and prepares graduates for the dynamically changing demands of the labor market, in line with the detailed objectives of the strategy in the areas of EDUCATION and TALENTS.

The Civil Engineering program at the second-cycle level clearly supports the IMPACT area by preparing highly qualified specialists capable of conducting advanced analyses, designing innovative solutions, and implementing projects of significant importance for the economic development of the country and the region. By developing competencies necessary for solving complex technical problems, graduates contribute to strengthening the University's impact on the socio-economic environment, in line with the objectives related to supporting research oriented toward practical needs.

The second-cycle study program is also closely linked to the SUSTAINABILITY area, emphasizing issues such as energy efficiency, durability, safety, and reducing the environmental impact of construction projects. Education in this field supports the strategic goals related to seeking and developing solutions that facilitate the achievement of sustainable development goals and aligns with the University's efforts toward a zero-emission and environmentally friendly environment.

An important aspect of the program's alignment with the University's strategy is the development of students' research competencies at the second-cycle level, supporting the SCIENCE and INNOVATION areas through participation in research projects, cooperation with industry, and the completion of application-oriented theses. Collaboration with the socio-economic environment reinforces the main theme of the strategy—COOPERATION—while also contributing to the objectives of the STUDENTS area related to the systematic support of student activity and development.

## Educational objectives and employment and continuing education opportunities

The primary educational objectives of second-cycle (master's) studies are to deepen and broaden knowledge in the field of civil engineering, including specialized, managerial, and modern computational methods as well as IT techniques used in civil engineering. Graduates should demonstrate a well-established commitment to continuous professional development, the ability to independently acquire and critically evaluate information, and the flexibility to adapt to the challenges of the labor market in a globalized and integrated Europe.

Graduates of second-cycle studies in Civil Engineering are prepared to take up positions requiring high-level engineering qualifications and managerial competencies, both domestically and internationally. They may work in design offices, construction companies, supervision and quality control units, consulting firms, and institutions involved in technical expertise and advisory services, performing roles related to planning, design, organization, and supervision of construction processes.

After completing the required professional internship, graduates may apply for licenses to perform independent technical functions in construction, including:

- design and management of construction works without limitations in the following specializations: structural and building engineering, bridge engineering, road engineering, railway engineering (in the field of railway structures), hydraulic engineering, and demolition engineering,
- design and management of construction works within a limited scope in the architectural specialization and in the installation specialization covering thermal, ventilation, gas, water supply, and sewage systems.

Graduates are also prepared to run their own business in the construction sector, work in government and local administration institutions, and systematically enhance their qualifications, including pursuing education in doctoral schools or other forms of third-cycle studies.

### **Description of the process and outcome of consultations on the proposed study program with the socio-economic environment**

The program was reviewed by the Łódź Regional Chamber of Civil Engineers, the body responsible for granting construction licenses and representing employers associated with the construction and installation industry.

### **Description of competencies expected from a candidate applying for admission to studies**

In accordance with the applicable admission resolution for a given academic year.

### **The unit organizing education**

Faculty of Civil Engineering, Architecture and Environmental Engineering

## Education program

### Semester 1

| Course                                             | Number of hours                                           | ECTS points | Form of verification | Obligatory |
|----------------------------------------------------|-----------------------------------------------------------|-------------|----------------------|------------|
| Theory of Elasticity and Plasticity                | Project work: 20<br>Lecture: 10                           | 3           | Graded assignment    | Obligatory |
| Structural Reliability                             | Laboratory classes: 10<br>Lecture: 10                     | 2           | Graded assignment    | Obligatory |
| Special Foundations                                | Laboratory classes: 20<br>Lecture: 10                     | 4           | Graded assignment    | Obligatory |
| Thermo-Renovation to Sustainable Building Standard | Laboratory classes: 20<br>Project work: 10<br>Lecture: 10 | 4           | Graded assignment    | Obligatory |
| Structural Mechanics                               | Project work: 20<br>Lecture: 20                           | 4           | Graded assignment    | Obligatory |
| Advanced Steel Structures                          | Project work: 20<br>Lecture: 20                           | 5           | Exam                 | Obligatory |
| <b>Sum</b>                                         | <b>200</b>                                                | <b>22</b>   |                      |            |

### Semester 2

| Course                        | Number of hours                            | ECTS points | Form of verification | Obligatory |
|-------------------------------|--------------------------------------------|-------------|----------------------|------------|
| Advanced Concrete Structures  | Project work: 40<br>Lecture: 20            | 6           | Graded assignment    | Obligatory |
| Modern Wooden Structures      | Laboratory classes: 20<br>Lecture: 10      | 4           | Graded assignment    | Obligatory |
| Building Information Modeling | Laboratory classes: 10<br>Project work: 20 | 3           | Graded assignment    | Obligatory |
| <b>Sum</b>                    | <b>120</b>                                 | <b>13</b>   |                      |            |

## brak

| Course                                 | Number of hours                                           | ECTS points | Form of verification | Obligatory                        |
|----------------------------------------|-----------------------------------------------------------|-------------|----------------------|-----------------------------------|
| Computer-Aided Structural Optimization | Laboratory classes: 10<br>Project work: 20<br>Lecture: 20 | 5           | Graded assignment    | Obligatory specialization courses |
| Prestressed Structures                 | Project work: 20<br>Lecture: 10                           | 4           | Exam                 | Obligatory specialization courses |
| <b>Sum</b>                             | <b>80</b>                                                 | <b>9</b>    |                      |                                   |

## brak

| Course                                        | Number of hours                                  | ECTS points | Form of verification | Obligatory                        |
|-----------------------------------------------|--------------------------------------------------|-------------|----------------------|-----------------------------------|
| Durability of Structures and Materials        | Laboratory classes: 20<br>Lecture: 10            | 4           | Exam                 | Obligatory specialization courses |
| Building Renovation and Heritage Conservation | Tutorials: 20<br>Project work: 20<br>Lecture: 10 | 5           | Graded assignment    | Obligatory specialization courses |
| <b>Sum</b>                                    | <b>80</b>                                        | <b>9</b>    |                      |                                   |

## Semester 3

| Course                                        | Number of hours                                           | ECTS points | Form of verification | Obligatory |
|-----------------------------------------------|-----------------------------------------------------------|-------------|----------------------|------------|
| Project Management                            | Laboratory classes: 10                                    | 2           | Graded assignment    | Obligatory |
| Building Acoustics                            | Laboratory classes: 10<br>Lecture: 10                     | 3           | Graded assignment    | Obligatory |
| Design and Modernization of Roads and Bridges | Laboratory classes: 10<br>Project work: 10<br>Lecture: 10 | 3           | Graded assignment    | Obligatory |

| Course                                   | Number of hours | ECTS points | Form of verification | Obligatory |
|------------------------------------------|-----------------|-------------|----------------------|------------|
| Foreign Language for Specialist Purposes | Tutorials: 45   | 2           | Graded assignment    | Obligatory |
| <b>Sum</b>                               | <b>105</b>      | <b>10</b>   |                      |            |

## brak

| Course                                              | Number of hours                                           | ECTS points | Form of verification | Obligatory                        |
|-----------------------------------------------------|-----------------------------------------------------------|-------------|----------------------|-----------------------------------|
| Design and Modeling of Advanced Concrete Structures | Laboratory classes: 20<br>Project work: 20<br>Lecture: 10 | 5           | Graded assignment    | Obligatory specialization courses |
| Steel Industrial Structures                         | Project work: 20<br>Lecture: 10                           | 3           | Graded assignment    | Obligatory specialization courses |
| <b>Sum</b>                                          | <b>80</b>                                                 | <b>8</b>    |                      |                                   |

## brak

| Course                                  | Number of hours                       | ECTS points | Form of verification | Obligatory                        |
|-----------------------------------------|---------------------------------------|-------------|----------------------|-----------------------------------|
| Renewable Energy Systems                | Project work: 10<br>Lecture: 10       | 2           | Graded assignment    | Obligatory specialization courses |
| Strengthening of Structures and Subsoil | Laboratory classes: 30<br>Lecture: 30 | 6           | Graded assignment    | Obligatory specialization courses |
| <b>Sum</b>                              | <b>80</b>                             | <b>8</b>    |                      |                                   |

## Semester 4

| Course                                                      | Number of hours                                  | ECTS points | Form of verification     | Obligatory                               |
|-------------------------------------------------------------|--------------------------------------------------|-------------|--------------------------|------------------------------------------|
| Economics and Entrepreneurship                              | Tutorials: 10<br>Project work: 10<br>Lecture: 10 | 3           | Graded assignment        | Obligatory                               |
| Technical and Environmental Aspects of Building Maintenance | Seminar: 10<br>Lecture: 10                       | 3           | Graded assignment        | Obligatory                               |
| Diploma Seminar                                             | Seminar: 20                                      | 2           | Graded assignment + exam | Obligatory                               |
| Final Project                                               | Diploma Thesis: 0                                | 20          | Pass                     | Obligatory<br>subjects to<br>choose from |
| <b>Sum</b>                                                  | <b>70</b>                                        | <b>28</b>   |                          |                                          |