App. no 2 to ZW 64/2012
Appendix no 2 to Program of studies

PROGRAMME OF STUDIES

FACULTY: Civil Engineering

MAIN FIELD OF STUDY: Civil Engineering

EDUCATION LEVEL: ~~I /~~ II * level, ~~licencjat / inżynier / magister /~~ magister inżynier*

FORM OF STUDIES: full-time ~~/ part-time*~~

PROFILE: general academic ~~/ practical *~~

SPECIALIZATION: Civil Engineering

LANGUAGE OF STUDY: English

Faculty Council resolution no.388/20/2016-2020 from 25.04.2018 r.

In effect since 1.10.2018 r.

1. Description

Number of semesters: ***3***

Number ECTS points necessary to obtain qualifications: ***90***

Prerequisites (particularly for second-level studies):

An applicant for second level studies in Civil Engineering in the Civil Engineering Department of Wroclaw University of Technology must have qualifications of first level studies and be competent in continuing education at second level studies in this faculty. Candidates applying for second level studies in Civil Engineering must:
- possess knowledge from selected fields of mathematics and physics which enables the understanding of the physical basis of construction and also the formulation and solving of simple problems in the area of civil engineering;
- possess knowledge from chemistry which enables the understanding of the basis of chemical properties and the construction of building materials;
- be able to read and understand architectural, constructional and geodesy drawings and make proper project documentation in a graphical environment on selected CAD software;
- possess knowledge and be competent in the area of structural mechanics, strength of materials and principles of the general formation of building structures;
- possess knowledge and ability to apply the principles of structural mechanics and bar construction analysis in the areas of statics, dynamics and stability;
- be able to apply appropriate computational models and carry out structural mechanic analysis of simple bar structures which are statically determinate and indeterminate;
- possess knowledge and skills in the area of designing selected elements and simple constructions made of: metal, reinforced concrete, wood, masonry and composite;
- possess knowledge and basic skills in designing hydrotechnical and bridge building structures and structures related to transport infrastructure;
- knows the basics of soil mechanics and principles of modeling, dimensioning and construction of foundations;

- knows the basics of building physics and understand the phenomenon of heat transfer and diffusion of moisture in building objects;
- be able to select and apply correct tools for solving issues regarding analysis, building structure design and carrying out construction works;
- be able to estimate costs and formulate schedules of building works, building site developments and building works execution projects;
- possess skills in the area of interpretation, presentation and documentation of simple experiments and also in the area of presentation and documentation of the results of task implementation with project characteristics.
The principles for verifying the competencies of candidates are determined by the appropriate resolutions of the Faculty Council.

After completion of studies graduates obtain professional degree of: **magister inżynier**

Qualifications: **2nd level**

Possibility of continuing studies: **3rd level studies**

Graduate profile, employability:

After finishing second level studies in the Civil Engineering Faculty, a graduate, using his acquired knowledge and skills is ready to make decisions regarding the appropriate usage of materials, construction design and construction projects. Knows the current trends in the design and execution of building projects. Uses principles of occupational health and safety. Is able to design buildings, knows the principles of structural mechanics and is able to formulate, create, and then use the appropriate computational models of complex engineering structures. Can make and read technical drawings, recognize geodesy and cartography documentations and manage construction works. Is able to formulate and solve new engineering, technical and organizational issues related to civil engineering. Can use modern computer aided technics in the design of constructional structures and projects. Can critically select arguments supporting collective decisions related to the execution of tasks in civil engineering. Is able to formulate and publish reports on the progress of carried out works.

Is able to work in a team and supervise a team's duties. Is responsible for the safety of a supervised team. Is aware of the need to improve his professional and personal competence. Follows ethical rules. Knows and uses the principles of construction law.

Has language skills in the fields of science and scientific disciplines relevant to the studied faculty and requirements for B+ level of the Common European Framework of Reference for Languages. Is prepared to continue his education at third level studies. Graduates are able to: solve complex design, organizational and technological issues, formulate and carry out research programs, run projects of international scope, participate in the marketing and promotion of building products, continue their education and participate in research and disciplines directly related to civil engineering and building production, constantly update their qualifications and knowledge and also manage large groups of people. Graduates are qualified to take a job in: construction and design offices, executive enterprises, research institutes and development centres and also guidence institutions disseminating knowledge from civil engeneering.

Futhermore, graduates of each specialization achieve additional extended competence refering to the education outcomes of their specialization:
A graduate of Building Structures possesses enriched knowledge and advanced design skills in the area of pre-stressed concrete structures, complex structures and high and thin-walled constructions. Furthermore, a graduate is competent at solving issues related to the rheology, reliability and limit states of constructions and also failures and renovations of constructions. A specificity of the specialization in Building Technology is to provide graduates extensive knowledge and competency in the area of methods of executing building structures, organizing building works, procedures of executing building investments and also managing building projects and industrial production of prefabricated elements. Graduates of this specialization possess knowledge and skills referring to the exploitation, renovation, modernization and diagnostics of building structures and real estate management.

The specialization in Hydroengineering Structures enables graduates to be competent in the area of designing hydrotechnical constructions, steel hydrotechnical constructions, specific concrete and municipal buildings. It also provides graduates knowledge about the exploitation and regulation of rivers and water-ways, water power plants, hydrotechnical tunnels, water and sewage installations, the renovation of hydrotechnical constructions and also permanent and temporary water drainage. The extensive competence of graduates of Underground and Urban Infrastructures comes as a result of finishing basic and field courses such as: building works and earth engineering, underground engineering, civil engineering, network infrastructure, maintenance of underground constructions, specific foundations and also foundation engineering in specific terrains. The specialization of Roads and Airports educates students who achieve extensive knowledge and skills in the area of materials and road surfaces, water drainage of traffic infrastructure, theory of road surface dimensioning, computer aided designing of roads and airports and also municipal engineering and municipal transport services.

Furthermore, graduates are competent in the area of transport systems. The specialization of Railway Engineering gives graduates extensive knowledge and competency in the area of rail surfaces theory, rail works technology, the design of railway stations, railway traffic engeneering, railway traffic navigation, railway exploitation, municipal engineering, drainage of traffic infrastructure, rail surface diagnosis, durability and reliability of rail surfaces and also computer methods in designing railway trucks.
A graduate of the specialization of Bridges, apart from possessing the same knowledge as graduates from the other specialisations, also has extended knowledge and skills in the area of bridge construction theory, the design and execution of concrete, metal and wooden bridges, computer aided design of bridges, testing and rehabilitation of bridges and primer coat constructions. A graduate also has a possibility to become acquainted with the computer systems which aid bridge management.

Theory of Structures is a specialization for particularly talented students. Graduates of this specialization are competent in the area of mathematical methods in mechanics, theory of plain girders and solving problems regarding the reliability and limit states of constructions. Futhermore, they possess extensive knowledge and skills in the dynamics of continuous systems, rheology and computer construction modelling.

The specialization of Civil Engineering carried out in English language provides graduates with extensive knowledge and competency in the area of the design and execution of multiple building structures such as: complex structures with reinforced concrete or metal constructions, housing buildings, municipal constructions, roads and highways, bridges and also objects of railway infrastructures. Furthermore, a graduate possesses extensive knowledge in the area of Hydraulic issues and also computer aided design. Each graduate can achieve more knowledge about the chosen constructions after choosing one of the wide range of modules that are on offer.

Indicate connection with University's mission and its development strategy:

The Civil Engineering Faculty on second level studies with specializations carried out during full-time studies: Building Structures; Building Technology; Hydroengineering Structrues; Underground and Urban Infrastructures; Roads and Airports; Railway Infrastructue, Bridges, Theory of Structures; Civil Engineering (conducted in English) which is run according to the mission and development strategy of the Civil Engineering Department of Wroclaw University of Technology. Studies on the Civil Engineering Faculty are closely related to scientific and research works carried out at the Civil Engineering Department by the chairs and divisions.

2. Fields of science and scientific disciplines to which educational effects apply

The Faculty of Civil Engineering with the general academic profile belongs to the area of education of technical science. Education outcomes relate to the field of the technical science and civil engineering discipline. Furthermore, the Faculty is related, at a basic extent, to architecture and urban planning, environmental engineering, materials engineering and transportation.

3. Concise analysis of consistency between assumed educational effects and labour market needs

The education program aims to comprehensively prepare highly qualified engineering technical staff in the widely considered field of civil engineering. Graduates of the Civil Engineering Department with the general academic profile are prepared to work independently in the field of organization and implementation of construction processes, managing the maintenance and exploitation of building infrastructure and are also prepared to participate in building structure designing processes. Graduates possess the knowledge and skills necessary to organize and direct a team's work in all areas of civil engineering. Education profiles and diploma specializations prepare students to be able to undertake work in the most wanted market areas: cubature building, industrial structures and also management of building processes (Building Structures; Building Technology), water constructions, ground and underground structures (Hydroengineering; Underground and Urban Infrastructures) and also in the area of transport infrastructure structures (Roads and Airports, Railway Infrastructures, Bridges).

Universal basic knowledge enables graduates to flexibly adapt to the changing needs of the labour market. The specialization of Theory of Structrues prepares graduates for research and science work, and the specialization Civil Engineering (conducted in English) gives graduates the opportunity to establish cooperation with international construction companies. The basis of all specializations is knowledge and skills which enable graduates to obtain appropriate professional qualifications.