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**DESCRIPTION OF
1,5-YEAR MASTER'S DEGREE PROGRAMME IN
BIM TECHNOLOGIES IN
CONSTRUCTION
AND CIVIL ENGINEERING**



General Entry	
Name of the Study Programme	BIM technologies in construction and civil engineering
Cycle /Level	National Qualification Framework of Ukraine: 7 th level; Qualifications Framework for the European Higher Education Area (QF for EHEA): 2 nd cycle; European Qualifications Framework for Lifelong Learning (EQF for LLL): Level 7
Type of Degree & Duration	Master's, full-time, 1 year 4 months, 90 credits
Institution	Educational and Scientific Institute «Prydniprovsk State Academy of Civil Engineering and Architecture» Ukrainian State University of Science and Technology, Dnipro, Ukraine
Objective(s) of a Study Programme	To provide comprehensive theoretical knowledge and skills in the field of managing digital information (BIM technologies) used in the construction and civil engineering and based on the utilization of a common digital representation of a construction object to facilitate the design, construction, operation, management, and life cycle processes.
Access to Professional Activity	The graduate can utilize BIM technologies during training and subsequent professional activities in the organization of construction processes, methods of managing the activities of construction organizations, information modelling technology for the calculation of building structures and design of the life cycle of buildings according to the criterion of sustainable development.
Discipline(s) / Subject area(s)	Main disciplines of this program are the those in design of building structures with the use of BIM technologies
General / Specialist Focus	Master Programme focused on use BIM technologies to solve complex engineering and research problems in the field of architecture and construction
Orientation	The SP is a professional and applied programme. Scientific and theoretical principles for improving practical experience in the field of construction and civil engineering, integration of training, innovation and production activities
Teaching & Learning Approaches	Main methods of teaching and learning are: lectures, practical work, laboratory classes, individual training on personal computers with software
Assessment Methods	Individual tasks; test tasks; taking control works in the classroom or during independent work; written and presented; defence of laboratory practicals.
Distinctive Features	International and national credit mobility. Use of BIM technologies for the design of construction projects.



Needs analysis of the labour market and other stakeholders

Needs of the labour market

The educational programme should ensure that the training content is consistent with the labour market needs and the prospects for the development of the construction sector, cooperation with enterprises and private construction firms, as well as cooperation with foreign partners.

Master graduates in BIM Technologies in Construction and Civil Engineering are requested to have:

Specific skills

- Ability to prepare, execute and operate technical documentation, have skills in working in the Unified State Electronic System in the field of construction in solving specific engineering and technical tasks, including the liquidation of the consequences of hostilities.
- Ability to use the methods of technology and organisation of building structures production, construction, reconstruction, liquidation of the consequences of hostilities and restoration of normal operation of buildings and structures
- Ability to develop and implement projects in the field of construction and civil engineering: capital repair, thermal renovation, and restoration projects.
- Ability to conduct surveys of residential, public, industrial buildings and civil defence structures
- Using of BIM technology software in solving complex engineering problems in the field of civil engineering, including energy efficiency.
- Ability to ensure safety of work performance and occupational safety during emergency recovery operations
- Ability to present the results of research, prepare scientific publications, participate in research grants, conferences, webinars and carry out teaching activities.

Soft skills

- Good reading/writing skills in Ukrainian and English;
- General computer skills (knowledge of Microsoft Office, Internet, Autodesk Revit).

Communication skills

- Ability to work in a team
- Analytical abilities and problem-solving skills
- Decision-making skills
- Planning and organization skills

Educational needs of the other stakeholders

No other stakeholders outside of those of the labour market have been consulted.



Study objectives

The main aim of the Master degree is to prepare highly qualified and competitive graduates in the field of managing digital information (BIM technologies) used in the construction and civil engineering and based on the utilization of a common digital representation of a construction object to facilitate the design, construction, operation, management, and life cycle processes.

Objectives of educational programme:

- acquiring comprehensive knowledge and competences in analyzing issues in the field of design, construction, reconstruction, operation, restoration of buildings and structures and project management, realizing the nature of the surrounding processes and phenomena, ensuring and conducting intercultural communication;
- acquisition of advanced knowledge and competences in the field of development and collaborative using of the construction object's information model (BIM model of the object), which is a set of structured and unstructured information data for developing of documentation accompanying the life cycle of the construction object;
- formation of high adaptability of graduates in the context of labor market transformation through interaction with employers and other stakeholders.

Programme Learning Outcomes

The following programme learning outcomes – intended as what a student is expected to know, understand and/or be able to demonstrate after completion of the learning process - have been established:

Knowledge and Understanding

- Is able to creatively apply fundamental knowledge and principles of the field of civil engineering studies to solve new engineering problems.
- Is able to critically evaluate innovative trends in civil engineering, and the latest scientific achievements of sustainable and energy-efficient buildings, in order to solve contemporary challenges in construction.

Engineering Analysis

- Is able to apply innovative methods to solve uncertain, atypical and complex problems in the field of civil engineering and sustainable and energy-efficient buildings.
- Is able systematically solve new, significant problems of scientific research, development and practical activities of the civil engineering field and sustainable buildings and apply construction engineering tasks using theoretical and information models, research, mathematical analysis, modelling and experimental research methods.
- Is able to make innovative decisions in construction engineering and sustainable building solutions, considering the aspects of environmental impact, circular economy, safety, and quality, by applying the latest science community-recognized methods, using information modeling and computer-aided design software to ensure their reliability and durability, develop rational design and technical solutions, feasibility studies, taking into account the specifics of the construction object.

Fundamental and Applied Research

- Is able to analyse the newest achievements in the construction industry, apply them to create innovations; use scientometric platforms, modern information and communication technologies in the construction sector, including the Unified State Electronic System in the Construction Sector (USESCS)
- Is able to evaluate the collected data sets necessary for preparing an engineering project independently.
- Is able to formulate scientific problems, plan and carry out analytical, modelling and experimental studies, evaluate obtained data and research results and formulate



conclusions.

- Is able to argue the selection of innovative methods and define limitations for implementing civil engineering and sustainable building solutions.

Skills of Practical Work in Solving Engineering Problems

- Is able to integrate interdisciplinary knowledge, digital skills, practical multidisciplinary civil engineering, and sustainable and energy-efficient building problem-solving in a constantly changing environment.
- Is able to evaluate advanced scientific, practical methods, and digital tools, their application limitations in solving tasks related to civil engineering.
- Is able to holistically evaluate the interaction of civil engineering, sustainable building activities, and their components in the global and national context.

Personal and Social Skills

- Is able to independently plan and organize professional activities, constantly learn and improve in the field of construction engineering, and sustainable buildings.
- Is able to communicate effectively with construction process participants and stakeholders to provide well-reasoned arguments when addressing civil engineering issues and present the activities' results on a national and international level.
- Is able to work in a team, adapt to changes, take leadership initiatives, generate business ideas, and plan their implementation.
- Is able to understand holistically the impact of civil engineering decisions on business, society, and the environment, follow legal engineering practices and professional ethics norms, and understand the responsibility for engineering activities.

Curriculum

The curriculum of the Master in BIM Technologies in Construction and Civil Engineering for the academic year 2024-25 is shown in attachment (Tables "Curriculum - Academic Year 2024-25").

For each course unit of the curriculum the following information are shown:

- year and semester of delivery;
- ECTS credits;
- lecturer (s).

The curriculum was approved by

Programme Units

Characteristics of the course units

The characteristics of the course units are reported in attachment (Table "Curriculum - Academic Year 2024-25. Characteristics of the Course Units").

For each course unit, the following information are shown:

- name;
- number of ECTS credits;
- course year and teaching period of delivery;
- learning outcomes specific of the course unit;
- contents;
- teaching and learning methods, also in terms of hours/credits for each form;
- typologies of educational activities or teaching techniques, also in terms of number of hours/credits for each technique;
- assessment methods;
- assessment criteria;
- assessment metrics;
- criteria of attribution of the final grade, if any;



- preparatory course units, if any;
- educational material of reference.

The definition of the characteristics of the programme units is coordinated by the PSACEA Academic Quality Assurance Board, particularly in order to avoid gaps or superimpositions in the definition of the specific learning outcomes and contents and to assure the suitability of the assessment methods to a correct assessment of the students' learning.

Characteristics of the graduation exam

The characteristics of the graduation exam are shown in attachment (Table "Characteristics of the Graduation Exam").

The following information are specified:

- workload, in terms of ECTS credits;
- requirements to be fulfilled by the final work;
- criteria for the attribution of the diploma grade.

Admission, Recognition, Progression and Attestation

Admission

Students who have a bachelor's degree and have passed the exam can be enrolled in the Master's degree in BIM Technologies in Construction and Civil Engineering.

Recognition

Certificate of accreditation of the EP, issued by the National Agency for Higher Education Quality Assurance No. 04016450 dated 04.05.2022.

The certificate of accreditation is valid until 01.07.2025.

Progression

Students' progression in their studies is regulated by the following criteria:

Frequency of the didactic activities

Admission to the next year

To be transferred to the 2nd year students must pass all exams and tests

Admission to the graduation exam

To be admitted to the graduation exam students must have accumulated all the ECTS credits established in the curriculum, except the credits attributed to the graduation exam.

Students who cannot attend the didactic activities for a long period for causes of *majeure force*.

Attestation

Attestation is carried out in the form of a public defence of the qualification work. After the



completion of the studies, the Master provides the graduates with the ‘Diploma Supplement’, which explains the qualification gained, including the achieved learning outcomes and the context, level, content and status of the pursued and successfully completed studies.

Teaching staff

The teaching staff of the programme is shown in attachment (Table “Teaching Staff - Academic Year 2024-25”).

For each member of the academic staff, the following information are shown:

- name;
- qualification;
- course units given in the Master;
- course units given in other programmes.

Facilities

Laboratories

Information about the laboratories is provided in the attachment (Table "Laboratories").

Libraries

Information about the libraries is provided in the attachment (Table "Libraries").

Partnerships

Partnerships for carrying out training periods outside the University

The list of the active partnerships for carrying out training periods outside the University is shown in attachment (Table “Partnerships for carrying out training periods outside the University”).

Partnerships for carrying out mobility periods

The list of the active partnerships for carrying out mobility periods is in attachment (Table “Partnerships for carrying out international mobility periods”).