Ministry of Education and Science of Ukraine

ODESA STATE ACADEMY OF CIVIL ENGINEERING AND ARCHITECTURE

Civil Engineering Institute

SILABUS
educational component – EC 14
Qualification work

Educational level	Master's
Field of knowledge	19 Architecture and Construction
Specialty	192 Building and Civil Engineering
Educational program	Industrial and Civil Engineering
Educational component scope	12 **credits ECTS** (360 academic hours)
Types of classroom training	
Individual tasks	qualification work
Forms of final (term) control	Public defense

When studying the educational component, higher education students will develop the following skills and competences to find optimal solutions when designing buildings and structures, to demonstrate the level of one's engineering qualifications and to make competent decisions independently.

Requirements for studying the educational component: general and professional disciplines of the first and second educational and professional level.

Program learning outcomes:

PLO 1. The ability to assess the overall efficiency of the construction enterprise.

PLO 2. The ability to use the provisions of regulatory legal acts in the professional field activities; draw up basic business contracts; navigate the licensing process of certain types of activities.

PLO 3. The ability to use regulatory and legal acts in everyday and professional life activities; to navigate in scientific, special literature and laws.

PLO 4. The ability to practically carry out measures to protect personnel and the population from the consequences accidents, disasters, natural disasters and the use of weapons; evaluate the stability of elements of objects of economic activity in emergency situations and determine the necessary measures regarding it increase; evaluate the radiation, chemical, bacteriological environment and the environment that can occur as a result of a natural disaster and accident.

PLO 5. Ability to apply numerical methods; calculate and analyze (evaluate) mathematical models.

PLO 6. Ability to apply systems of organization and execution of preparatory work on workplace; compile a list of measures related to the normative state of the security system and a possible deviation in the extraordinary direction of the production situation; have skills in optimal management of several workplaces in matters of industrial safety activity.

PLO 7. The ability to assess the danger of aggressive influences on building structures and structures - atmospheric, chemically and biologically active environments, leakage and stray currents etc., develop and implement measures to protect against them and ensure the required durability of structures and buildings.

PLO 8. Use the technical Ukrainian language orally and in writing.

PLO 9. Ability to design structures from modern materials; evaluate work and the stress state of buildings

and structures in general, their structural elements, redistribution of efforts in connection with a change in the design scheme; solve the issue of assessment of bearing capacity of constructions.
PLO 10. The ability to independently solve the problems of choosing the optimal energy sources, including non-traditional ones, and in the conditions of production activities - to independently solve the problems of choosing the most efficient heat, water, and energy supply systems.
PLO 11. Ability to design modern engineering networks; resolve issues of assessment and equipment to ensure their operational suitability, using modern technologies of construction and repair of these systems.
PLO 12. The ability to carry out inspections of the technical condition of buildings, structures and engineering communications, and give an assessment of this state; evaluate their further operational suitability or the need to develop a project to restore this suitability; calculate the level the necessary increase in the bearing capacity of the structure to ensure operational suitability of the building.
PLO 13. Ability to design buildings and structures, including using software computer design systems based on an effective combination of innovative technologies and performing multivariate calculations of metal structures.
PLO 14. Design structures of buildings and structures in order to ensure their strength, stability, durability and safety, ensuring reliability.
PLO 15. Perform technical and economic justifications of constructive, technological, organizational solutions for the construction or reconstruction of buildings and structures, to develop technical documentation for projects and their elements.
PLO 16. Ability to consider social, environmental, ethical, economic and commercial considerations affecting the implementation of construction solutions.
PLO 17. The ability to find optimal solutions when creating certain types of construction products taking into account architectural and planning requirements, strength, durability, safety life activity, quality, cost, terms of execution and competitiveness.
PLO 18. The ability to justify and make optimal decisions on the arrangement of the basics and foundations in special conditions.
PLO 19. The ability to apply knowledge in design and research work on the use modern information technologies in solving seismic resistance problems.
PLO 20. The ability to study the construction object in accordance with the chosen subject of the master's degree works; collect and analyze the necessary material (source information) for implementation master's thesis; apply the knowledge and skills acquired throughout the course of study.
PLO 21. Implement effective methods of managing complex construction projects with awareness of responsibility for decisions made and ensuring the quality of work.

Differentiated program learning outcomes:
to know:
- modern building materials, constructions, technological processes and methods of organization and management of modern industrial and civil construction;
- basic principles of fracture mechanics; methods of determining stress intensity for various designs; physical and mechanical foundations of durability on the basis of legal acts and reference materials, current standards and technical conditions, instructions and other regulations documents in professional activity;

to possess:
- the ability to use regulatory and legal acts in everyday and professional activities; navigate in scientific, special literature and laws;
- the ability to study the initial data for the design of the construction object in accordance with the chosen topic of the master's work; collect and analyze the necessary material for implementation master's thesis; apply the knowledge and skills acquired throughout the course of study;
- the ability to perform technical and economic justifications of constructive, technological, organizational solutions for the construction or reconstruction of buildings and structures, to develop technical documentation for projects and their elements;

to be able to:
- take into account social, ecological, ethical, economic and commercial aspects affecting the implementation of construction solutions;
- to find optimal solutions when designing buildings and structures taking into account architectural

and planning requirements, quality, durability, strength, cost, deadlines and competitiveness;
- to design buildings and structures, including with the use of software complexes, based on an effective combination of innovative technologies for their implementation, multivariate calculations of concrete and reinforced concrete, metal structures.

Thematic plan

1. Architectural section
2. Constructive section
3. Division of foundations
4. Division of technology and organization
5. Engineering and research department
6. Economic section
7. Labor protection

Score criteria and diagnostic tools

The minimum and maximum score for the «attestation» in the educational component «Qualification work» ranges from 60 points to 100 points.

The educational component includes the following task – qualification work.

The graduate master's thesis under the professional training program is an independent work in the form of an explanatory note and sheets of drawings.

It consists of two main parts. The first part is the calculations and design of the traditional sections of the construction project: architectural, structural, selection of bases and foundations, organizational, technological and economic. The second part is engineering research. In this section, where students must demonstrate their ability to choose the most effective solution.

The qualification work must not contain plagiarism.

Term control is carried out in the form of public defense. Attestation of applicants is carried out in the form of a public defense of a qualification (diploma) thesis. It ends with the award of a master's degree under the educational and professional program Industrial and civil construction, specialty 192 "Building and Civil Engineering".

Information support

Main sources of information

1. DBN V.2.2-15:2019 Residential buildings. Main provisions K.: Ministry of Regional Development and Construction of Ukraine, 2019. 39p. – Valid from 01.12.2019.
2. DBN A.3.1-5-2016 Organization of construction production. - K.: Ministry of regional development and construction of Ukraine, 2016. 51p. – Effective from 01.09.2016.
3. Technology of construction production / Study guide. V.O. Galushko, O.I. Meneilyuk et al. – Odesa, ODABA, 2020. 423 p.
4. DBN B.2.6-198:2014 with amendment No. 1. Steel structures. Design standards. - K.: Ministry of Regional Construction of Ukraine, 2022. 224p.
5. DBN V.2.6-161:2017 "Wooden structures. Main provisions" - To: Ministry of the Region of Ukraine, 2018. 111 p.
6. DBN B.1.2-2:2006 with amendments No.1 and No. 2. Loads and influences. Design standards. - K.: Ministry of Construction of Ukraine, 2020. 72 p.
7. DSTU B V.1.2-3:2006 Deflections and displacements. Design requirements. - K.: Ministry of Construction of Ukraine, 2006. 15 p.
8. DSTU B V.2.6-210:2016 Assessment of the technical condition of steel building structures that are exploited Ministry of Construction of Ukraine, K.: 2016. 54 p.
9. DBN A.3.1-5-2016 Organization of construction production. - K.: Ministry of regional development and construction of Ukraine, 2016. 61p. – Effective from 01.01.2016.
10. DBN A.3.2-2-2009 Labor protection and industrial safety in construction. - K.: Ministry of regional development and construction of Ukraine, 2012. 96 p. – Effective from 04/01/2012.
11. DSTU-N B A.2.2-11:2014 Resolution on author supervision of

construction. - K.: Ministry of Regional Development and Construction of Ukraine, 2014. 10 p. – Effective from 01.07.2015
12. DBN A.2.2-3:2014 Composition and content of project documentation for construction. K.: Ministry of Regional Development and Construction of Ukraine, 2014. 34 p. – Effective from 01.10.2014.