

## Ministry of Education and Science of Ukraine



### ODESA STATE ACADEMY OF CIVIL ENGINEERING AND ARCHITECTURE

Civil Engineering Institute  
Department of Construction Mechanics

#### **SILABUS** **educational component – EC 11** Building Information Management (BIM)

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	3 <b>credits ECTS</b> (90 academic hours)
Types of classroom training	Lectures, practical classes
Individual tasks	Calculated and graphical work
Forms of final (term) control	credit

#### **Lecturer(s):**

Mykola Sur'yaninov, ScD, professor, head of the department, [sng@ogasa.org.ua](mailto:sng@ogasa.org.ua)

When studying the educational component, higher education students will develop the following skills and competences of construction and use of information modeling (BIM) throughout the life cycle of a building or structure. Information about the most famous application program packages is provided creation of an information model. Within the framework of this discipline, students acquire skills collective work on the project.

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

#### **Program learning outcomes:**

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

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

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

**PLO 13.** Ability to design buildings and structures, including using software computer design systems based on an effective combination of innovative technologies and performance of 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 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.

### **Differentiated program learning outcomes:**

#### **to know:**

- basic definitions and concepts of information modeling in construction, principles use of the information model at all stages of the construction object's life cycle;
- basic concepts related to construction structures used at all stages of the construction object's life cycle;
- basic methods of architectural and structural modeling of building structures;

#### **to possess:**

- increased accuracy and consistency of design;
- quick implementation of design changes;
- high-quality drawings, specifications generated from BIM models;

#### **to be able to:**

- create an information model of the construction object, export the analytical part of models into calculation complexes, organize collective work on the project;
- work with modern software complexes for creation and management of information model;
- perform basic calculations on the strength of structures to determine their main parameters of the stress-strain state.

### **Thematic plan**

Topic 1. BIM in the world and in Ukraine. General characteristics of BIM;

Topic 2. Examples of BIM use in global practice;

Topic 3. Building an information model of the building;

Topic 4. Design evolution. Systems of automated design and information modeling of buildings;

Topic 5. Work with premises, types and specifications;

Topic 6. Work with letters. Import, export, printing;

Topic 7. Work with reinforced concrete elements;

Topic 8. BIM technology software.

### **Score criteria and diagnostic tools**

The minimum and maximum score for the «credit» in the educational component «Building Information Management (BIM)» ranges from 60 points to 100 points.

**The educational component includes the following task** – calculated and graphical work.

Construction and use of information modeling (BIM) is considered. Work with premises, types and specifications. Work with letters, import, export, printing.

The work is performed in the form of an explanatory note and a graphic part.

**Term control** is carried out in the form of credit. The credit score is set on the basis of the results of the current tasks control during the semester.

### **Information support**

#### **Main sources of information**

1. Informatics. Information technologies in construction. Automated systems designing. Bazhenov V.A., Kryksunov E.Z., Perelmutter A.V., Shishov O.V. / Under the editorship P.P. Lizunova. Textbook. — K.: Karavela, 2019. 488 p.
2. Study guide: Information technologies in design / Bazhanova A.Yu., Lazareva D.V., Sur'yaninov M.G., Odesa, ODABA, 2018. 290 p.
3. Methodical instructions and output data are intended for the performance of individual tasks with discipline "BIM-technology" for students of specialty 192 "Construction and civil engineering", Odesa, ODABA, 2022. 46 p.

#### Additional sources of information

1. DSTU EN ISO 13567-1:2018. Technical documentation for products. Arrangement and naming levels for CAD. Part 1. Overview and principles (EN ISO 13567-1:2017, IDT; ISO 13567-1:2017, IDT).
2. Wing Eric. Autodesk Revit 2017 for Architecture/ Wing Eric, 2017. 297c.