

## STRENGTH OF MATERIALS

### COURSE SYLLABUS ABSTRACT

**Specialty** 7-07-0732-01 – Construction of buildings and structures,  
(speciality code and name)

Industrial and civil engineering, Highways  
(concentration)

6-05-0732-02 – Real estate expertise and management  
(speciality code and name)

| Specialty 7-07-0732-01                        | full-time | STUDY MODE                       |                               |                               |
|---|-----------|----------------------------------|-------------------------------|-------------------------------|
|   |           | Concentration                    |                               |                               |
|   |           | Industrial and civil engineering |                               | Highways                      |
|   |           | part-time                        | part-time (shortened program) | part-time (shortened program) |
| Year  | 2         | 2, 3                             | 2                             | 1                             |
| Semester                                      | 3,4       | 4, 5                             | 3                             | 2                             |
| Lectures, hours                               | 50        | 10                               | 6                             | 6                             |
| Practical classes (seminars), hours           | 50        | 10                               | 6                             | 6                             |
| Laboratory classes, hours                     | 32        | 8                                | 4                             | 4                             |
| Exam, semester                                | 3, 4      | 4, 5                             | 3                             | 2                             |
| Contact hours                                 | 132       | 28                               | 16                            | 16                            |
| Independent study, hours                      | 120       | 224                              | 236                           | 236                           |
| Total course duration in hours / credit units | 252/7     | 252/7                            | 252/7                         | 252/7                         |

| Specialty 6-05-0732-02                        | STUDY MODE |
|---|------------|
|   | full-time  |
| Year  | 2          |
| Semester                                      | 3,4        |
| Lectures, hours                               | 50         |
| Practical classes (seminars), hours           | 32         |
| Laboratory classes, hours                     | 16         |
| Pass/fail, semester                           | 4          |
| Exam, semester                                | 3          |
| Contact hours                                 | 98         |
| Independent study, hours                      | 118        |
| Total course duration in hours / credit units | 216/6      |

#### 1. Course outline

The study of the basic concepts, laws and methods of resistance of materials and their application for the calculation of typical elements of building structures for strength, rigidity and stability with guaranteed durability.

#### 2. Course learning outcomes

Upon completion of the course, students will be expected to

##### know:

- the main hypotheses of the resistance of materials on the properties of structural materials and the nature of deformation;
- methods for calculating typical structural elements for strength, rigidity and stability;
- methods of experimental investigation of stresses and strains;
- principles of calculation of the simplest statically indeterminate core systems.

##### be able to:

- to make rational calculation schemes that provide a sufficient degree of accuracy in combination with the simplicity of engineering calculation;
- perform engineering verification and design calculations of structural elements in accordance with the selected criteria and analyze the solutions obtained;
- perform elementary calculations under dynamic (shock) loading.

##### to possess a skill:

- according to the calculation of structural elements experiencing simple and complex types of resistance from static, temperature and dynamic influences;
- analysis of the stress-strain state of structures;
- to determine the conditions for the occurrence of limit states at design points of the structure according to classical strength theories.

#### 3. Competencies

Specialty 7-07-0732-01: BPC-9 «Apply methods for calculating strength and deformation characteristics of building materials, parts, products and structures to solve engineering and construction problems».

Specialty 6-05-0732-02: SK-2 «Apply the laws of kinematics and dynamics to perform engineering calculations"; SK-4 "Apply methods for calculating the strength and deformative characteristics of building materials, parts, products and structures to solve engineering and construction problems».

#### 4. Requirements and forms of midcourse evaluation and summative assessment

When studying the discipline, a modular rating system for assessing students' knowledge is used.

Intermediate certification – exam (dif. test for 6-05-0732-02).