

# ANNOTATION TO THE WORK PROGRAM OF THE DISCIPLINE

## MECHANICS OF MATERIALS

### Specialties:

6-05-0713-04 Automation of technological processes and productions

profiling: automation of technological processes and productions in mechanical engineering

6-05-0714-02 Technology of mechanical engineering, metal-cutting machines and tools

profiling: technology of mechanical engineering

equipment and technologies of highly efficient processes of material processing

technological equipment of machine-building production

6-05-0714-03 Engineering and technical design and production of materials and products made from them

profiling: welding production equipment and technology

**Qualification:** Bachelor's degree

### Specialties:

6-05-0713-04-1.1 (ATP); 6-05-0714-02-1.1 (TM);

6-05-0714-02-1.2 (VEP); 6-05-0714-02-1.3 (TOMP)

|   | The form of higher education |  |  |
|---|------------------------------|--|--|
|   | Full-time<br>(full-time)     | Correspondence for<br>specialists.<br>6-05-0714-02-1.1<br>«Technology of<br>mechanical<br>engineering» | Correspondence<br>abbreviated<br>for spec.<br>6-05-0714-02-1.<br>«Technology of<br>mechanical engineering» |
| Course  | 2                            | 2, 3   | 1  |
| Semester  | 3, 4                         | 4, 5   | 2  |
| Lectures, hours                                 | 68                           | 14   | 8  |
| Practical exercises, hours                      | 68                           | 14   | 8  |
| Laboratory classes, hours                       | 32                           | 8  | 4  |
| Classroom test, semester (hours)                | –                            | 4 (2 hours)  | –  |
| Exam, semester                                  | 3,4                          | 4, 5   | 2  |
| Classroom hours in the academic<br>discipline   | 168                          | 38   | 20   |
| Independent work, hours                         | 120                          | 250  | 268  |
| Total hours of academic<br>discipline / credits | 288/8                        | 288/8  | 288/8  |

### Specialty 6-05-0714-03-1 (O and TSP)

|  | The form of higher education education |                |                               |
|--|--|----------------|-------------------------------|
|  | Full-time                              | Correspondence | Correspondence<br>abbreviated |
| Course                                       | 2                                      | 2, 3           | 1                             |
| Semester                                     | 3,4                                    | 4, 5           | 2                             |
| Lectures, hours                              | 68                                     | 14             | 8                             |
| Practical (seminar) classes, hours           | 50                                     | 10             | 8                             |
| Laboratory classes, hours                    | 16                                     | 4              | 4                             |
| Classroom test, semester (hours)             | –                                      | 4 (2 hours)    | –                             |
| Exam, semester                               | 3, 4                                   | 4, 5           | 2                             |
| Classroom hours in the academic discipline   | 134                                    | 30             | 20                            |
| Independent work, hours                      | 226                                    | 330            | 340                           |
| Total hours of academic discipline / credits | 360/10                                 | 360/10         | 360/10                        |

## 1 The purpose of the academic discipline

The purpose of the discipline is to form students' basic knowledge and skills:

- according to the calculation of a typical structural element – a bar (rod, shaft, beam) used in difficult operating conditions under the influence of both static and dynamic loads, for strength, rigidity and stability;
- according to the rational purpose of structural materials and cross-sectional shapes that provide the required indicators of reliability, safety and cost-effectiveness of structures.

## 2 Planned results of the study of the discipline

As a result of studying the discipline, the student should

### **know:**

- the basic hypotheses of material mechanics about the properties of structural materials and the nature of deformation;
- general requirements for structural materials;
- methods for calculating typical structural elements for strength, rigidity and stability;
- methods of experimental investigation of stresses and strains;

### **be able to:**

- to apply in practice methods and approaches to solving engineering problems of calculating structures, parts and assemblies of machines for strength, rigidity and stability;
- to carry out the formulation of tasks taking into account the complex operational conditions of the operation of the object under study;

### **have a skill:**

- theoretical and experimental analysis of structures for strength, rigidity and stability, taking into account the properties of structural materials;
- calculation of structures for their optimal use.

## 3 Requirements for mastering the academic discipline

The development of this academic discipline should ensure the formation of the following competencies:

| Names of formed competencies   |
|--|
| For specialties 6-05-0714-02-1.1 «Technology of mechanical engineering» and 6-05-0714-02-1.3 «Technology and equipment of machine-building production»   |
| Use knowledge about the properties of structural materials and their interrelationships with the strength characteristics of parts to determine stress and deformation in typical machine parts.                       |
| For specialty 6-05-0714-02-1.2 «Equipment and technologies of highly efficient material processing processes»  |
| Use knowledge about the properties of structural materials and their interrelationships with the strength characteristics of parts to determine stress and deformation in typical machine parts.                       |
| For the specialty 6-05-0714-03-1 «Equipment and technology of welding production»  |
| To know modern ideas about the properties of structural materials and their interrelationships with the strength characteristics of parts, to be able to determine stresses and deformations in typical machine parts. |
| For the specialty 6-05-0713-04-1.1 «Automation of technological processes and productions (by directions)»   |
| To know modern ideas about the properties of structural materials and their interrelations with the strength characteristics of parts, to be able to determine stresses and deformations in typical machine parts.     |

## 4 Educational technologies

When studying the discipline, a modular rating system for evaluating students' knowledge is used. Forms of classes in the study of various topics of the course: traditional, multimedia.