**PROSPECTS FOR THE CREATION AND APPLICATION OF NEW MATERIALS IN MECHANICAL ENGINEERING**
**(name of the discipline)**

**ANNOTATION**
**TO THE CURRICULUM OF THE INSTITUTION OF HIGHER EDUCATION**

**Specialty** 7-06-0714-02 “Innovative technologies in mechanical engineering.”
**Profilings** "Mechanical engineering and mechanical science”, “Welding technologies”, “Computer engineering of transport and technological machines”

| Form of higher education | | |
|---|---|---|
| | Full-time (daytime) | Extramural |
| Well | 2 | 2 |
| Semester | 3 | 3 |
| Lectures, hours | 34 | 8 |
| Exam, semester | 3 | 3 |
| Classroom hours per academic discipline | 34 | 8 |
| Independent work, hours | 74 | 100 |
| Total hours per academic discipline / credit units | 108/3 | |

**1. Brief content of the discipline**

The discipline “Prospects for the creation and application of new materials in mechanical engineering” contains general ideas about the classification of modern structural materials used in mechanical engineering, methods of their production and processing, as well as structure, properties and areas of application.

**2. Learning Outcomes**

A student who has studied the discipline should **know:**
– basic patterns of formation of the structure and properties of promising materials;
– technological methods for obtaining and controlling the properties of materials;
– areas of application of advanced materials;
**be able to:**
– use the features of modern materials to solve practical problems;
– determine the requirements for materials operating under given operating conditions;
– identify the most promising materials;
**to possess a skill:**
– skills of an integrated approach to choosing the optimal type and composition of materials when solving simple physical and technical problems;
– skills in using reference, scientific, technical and technical literature on the physics of materials, methods of their formation and processing.

**3. Formed competencies:**

- Solve research and innovation problems based on the use of information and communication technologies.
- Provide communications, demonstrate leadership skills, be capable of team building and developing strategic goals and objectives.
- Develop innovative sensitivity and ability for innovative activities.
- Be able to predict the conditions for the implementation of professional activities and solve professional problems in conditions of uncertainty.
- Use knowledge about the physical foundations of nanotechnology and concentrated energy flows, new materials and prospects for their development when designing highly efficient technological processes for the manufacture of machine parts.
- Apply information about theoretical principles, methods and means of research and testing of working machines when creating new and modernizing existing machines.

**4. Requirements and forms of current and intermediate certification**

Current and intermediate certification is carried out in written and oral-written form through reports on laboratory work with their oral defense, a written exam.