

NANOMATERIALS AND NANOTECHNOLOGIES

(name of the discipline)

COURSE SYLLABUS ABSTRACT

Specialty 6-05-0714-02 Mechanical engineering technology, metal-cutting machines and tools

Profiling: Equipment and technologies for highly efficient material processing processes

	STUDY MODE
	Full-time
Year	3
Semester	5
Lectures, hours	16
Laboratory classes, hours	16
Pass/fail, semester	5
Classroom hours per academic discipline	32
Independent work, hours	76
Total hours per academic discipline / credit units	108/3

1. Course outline

The discipline "Nanomaterials and Nanotechnologies" contains general ideas about the classification of material objects, methods for their study, the features of the state and methods for obtaining low-sized particles, the structure and properties of nanosized particles used in materials science, the features of the energy state of nanosized particles, the prospects for the development of nanomaterials and nanotechnologies in mechanical engineering.

2. Course learning outcomes

Upon completion of the course, students will be expected to **know**:

- basic ideas about the structure and properties of nanomaterials, technological methods for obtaining and controlling their properties, processing technology;
- physical foundations of processes occurring in systems containing nanoparticles; basic methods for obtaining nanomaterials;

be able to:

- use the skills of structural features of nanocomposite systems, physical and chemical methods of controlling their properties, physical and chemical bases, principles and methods of research, testing and diagnostics of substances and materials;

to possess a skill:

- skills of an integrated approach to the choice of nanomaterials in 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 of materials and technologies for their processing and modification.

3. Competencies

Know the properties, modern methods of physical analysis, technology for obtaining and processing nanomaterials and be able to apply this knowledge to manage product quality

4. Requirements and forms of midcourse evaluation and summative assessment

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