DEVELOPMENT OF COMPUTER-AIDED DESIGN SYSTEMS IN MECHANICAL ENGINEERING

(course title)

COURSE SYLLABUS ABSTRACT

Speciality: 1-36 80 02 – Innovative technologies in mechanical engineering.
Specialisation profiling "Mechanical engineering and mechanical engineering"

	STUDY MODE	
	full-time	part-time
Year	1	1
Semester	1	2
Lectures, hours	36	8
Laboratory classes, hours	18	4
Pass/fail, semester	1	2
Contact hours	54	12
Independent study, hours	54	96
Total course duration in hours / credit units	108/3	108/3

1. Course outline.

The purpose of the discipline is to present to students the theoretical foundations of modern methods of computer-aided design and construction of three-dimensional models of machine-building objects, as well as modeling the dynamics and analyzing their strength.

2. Course learning outcomes.

As a result of mastering the academic discipline, the student should

know:

- structure and principles of building computer-aided design systems;
- basic methods of computer-aided design of machine-building objects, technological processes;
- methods for setting tasks for computer-aided design of various design procedures, operations, their formalization and algorithmization;
- current state of computer-aided design systems;
- methods of work in the environment of computer-aided design systems with different levels of design automation;
- a methodology for automating programming in the CAM environment of systems of technological operations performed on CNC machines;
- methods of computer design of structures and technologies;
- the basics of building three-dimensional models of machine-building objects;
- basic principles for solving problems of engineering analysis of the dynamics and strength of machines;
- modern computer-aided design systems and engineering analysis systems;

be able to:

- build three-dimensional solid models in modern CAD systems;
- perform engineering analysis of the dynamics and strength of machines in modern CAE systems;
- creatively apply the acquired knowledge in solving problems of engineering analysis of machine-building objects;
- to design technological processes in the environment of modern computer-aided design systems;
- to carry out the formulation and algorithmization of the main tasks of designing machine-building objects, technological processes;
- to program in the environment of CAM systems technological operations performed on CNC machines;

possess:

- skills in computer design of structures and technologies;
- skills in solving problems of computer analysis of the dynamics and strength of machines.
- skills in using the basic software of computer-aided design systems in the development of automated design procedures for designing, modeling and analyzing automation tools and equipping mechanical assembly operations;
- methods of computer-aided design, modeling and digital prototyping of automation equipment and equipment for mechanical assembly production.

3. Competencies.

Mastering this academic discipline should ensure the formation of the following competencies:

CK-4: Have information about effective methods of computer-aided design in mechanical engineering, application software packages in this area.

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

To assess the level of knowledge of students, the following diagnostic tools are used: written reports on laboratory work with their oral defense; submission of an account.