CAD OF TECHNOLOGICAL PROCESSES

COURSE SYLLABUS ABSTRACT

6-05-0714-02 «Mechanical engineering technology, metal cutting machines and tools»
(speciality code and name)
Mechanical engineering technology, Equipment and technologies for high-efficiency material processing processes
(concentration)

6-05-0713-04 «Automation of technological processes and productions»
(speciality code and name)
Automation of technological processes and productions in mechanical engineering
(concentration)

	STUDY MODE				
	full-time			**part-time**	**part-time (shortened program)**
	6-05-0714-02-1	**6-05-0714-02-2**	**6-05-0713-04**	**6-05-0714-02**	
Year	4	4	4	5	4
Semester	8	8	8	9	7
Lectures, hours	24	24	24	6	6
Laboratory classes, hours	24	18	24	6	6
Exam, semester	8 семестр	8 семестр	-	9 семестр	7 семестр
Pass/fail, semester	-	-	8 семестр		
Contact hours	48	42	48	12	12
Independent study, hours	42	48	42	78	78
Total course duration in hours / credit units	90/3	90/3	90/3	90/3	90/3

1. Course outline

The purpose of the discipline is to train specialists who are familiar with modern methods of automation of technological process design and automation tools for mechanical and assembly production using computers to solve the pressing problem of mechanical engineering: reducing the time, labor intensity, and improving the quality of technological production preparation.

2. Course learning outcomes

Upon completion of the course, students will be expected to

- know the structure and principles of building CAD systems for technological processes; modern terminology in the field of automation of technological process design; basic methods of automation of technological process design in mechanical and assembly production; methods of setting tasks for automated design of various design procedures and operations, their formalization and algorithmization; the current state of CAD systems for technological processes; methods of working in the environment of CAD systems for technological processes with different levels of design automation; methods of structural and parametric optimization of technological processes; methods of automation of programming in the environment of CAM systems for technological operations performed on CNC machines;

– be able to design technological processes of various degrees of detail in the environment of modern CAD/CAM/CAE systems based on generalized technological processes; configure CAD/CAM/CAE systems databases and knowledge bases for automated solution of logical and computational design tasks; formulate and algorithmize the main design tasks for mechanical assembly production processes; program technological operations performed on CNC machines in the CAM (Computer Aided Manufacturing) system environment;

- to possess a skill to create two-dimensional and three-dimensional geometric models of production objects and automation tools for mechanical assembly operations in a CAD (Computer Aided Design) environment; use basic CAD software to develop automated design procedures for the design, modeling, and analysis of automation tools for mechanical assembly operations; automate the design, modeling, and digital prototyping of automation tools for mechanical assembly production; use integrated programming systems to automate design procedures for modeling and analysis of automation tools for mechanical assembly production.

3. Competencies

Know the methods of machine design of technological processes, presentation of information about a part and a process in a computer, search for analogues in databases, design of route and operational technological processes of mechanical and assembly production (6-05-0714-02).

To be able to ensure a high level of automation in the design of technological processes, and to know the principles and types of automated process control systems (6-05-0714-02-2).

Know the theoretical foundations and technology of designing technical systems, the principles of working in modern CAD packages, and have knowledge of the regulatory and technical framework for solving design problems (6-05-0713-04).

4. Requirements and forms of midcourse evaluation and summative assessment

Current certification includes oral defense of laboratory works and performance of a test. When defending laboratory works, the student answers control questions.

Forms of intermediate certification are exam (special. 6-05-0714-02) or test (special. 6-05-0713-04). Students' intermediate assessments are conducted in written form.

The exam ticket includes two theoretical questions and a practical task.

The test includes two theoretical questions and a task that correspond to the content of the competencies being formed.