

## **THEORY OF MECHANISMS AND MACHINES**

(course title)

### **COURSE SYLLABUS ABSTRACT**

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

**Specialization "Technology of mechanical engineering", "Equipment and technologies of highly efficient material processing processes", "Technological equipment of machine-building production".**

**Specialty 6-05-0713-04 "Automation of technological processes and productions"**

**Specialization "Automation of technological processes and productions in mechanical engineering"**

	full-time	part-time	part-time (shortened program)	full-time
	<b>6-05-0714-02</b>			<b>6-05-0713-04</b>
Year	2	2	2	2
Semester	4	4	3,4	4
Lectures, hours	34	8	8	34
Practical classes (seminars), hours	16	4	4	16
Laboratory classes, hours	16	4	4	16
Course project, semester	4	4	4	4
Exam, semester	4	4	3	4
Contact hours	66	16	16	66
Independent study, hours	42	92	92	42
Total course duration in hours / credit units	108/3			180/5

**Specialty 6-05-0714-03 "Engineering and technical design and production of materials and products from them"**

**Profiling "Equipment and technology of welding production"**

**Specialty 6-05-0722-05 "Production of products based on three-dimensional technologies"**

	full-time	part-time	part-time (shortened program)	full-time
	<b>6-05-0714-03</b>			<b>6-05-0722-05</b>
Year	2	2	2	2
Semester	4	4	3	4
Lectures, hours	34	8	6	34
Practical classes (seminars), hours	16	4	4	16
Laboratory classes, hours	16	4	4	16
Course project, semester	4	4	3	
Exam, semester	4	4	3	4
Contact hours	66	16	14	66
Independent study, hours	42	92	94	42
Total course duration in hours / credit units	108/3			108/3

#### **r1 Summary of the academic discipline**

The purpose of teaching this discipline is to train future engineers in the field of mechanical engineering technology in general methods of analysis, design and research of mechanisms applied to any practical tasks arising in the production process. This knowledge is necessary not only when designing new mechanisms that ensure technological processes, but also for their proper operation.

#### **2 Learning outcomes**

As a result of mastering the discipline, the student should know: the basic theoretical provisions of the structure, kinematics, dynamics and control of machine systems, individual machines and mechanisms, their

component parts, taking into account the conversion and transfer of energy, materials and information; measuring equipment for determining the kinematic and dynamic parameters of mechanisms and machines; the basics of the structure of mechanisms; be able to: make design schemes (models) of machines and mechanisms suitable for solving technical problems arising at various stages of machine design; develop algorithms for calculating parameters on a computer, perform specific calculations; conduct research on the movement of machines and mechanisms with elastic links; possess: principles of designing the main types of mechanisms; kinematic and dynamic calculations; calculations to obtain optimal characteristics of mechanisms and machines in terms of their energy intensity and energy consumption.

### **3 Emerging competencies**

For the specialty 6-05-0714-02 "Technology of mechanical engineering, metal-cutting machines and tools": - To master the basics of research, to search, analyze and synthesize information. - is to be able to develop and improve in professional activities. - Master the methods of modeling geometric and kinematic relationships in mechanisms, synthesize mechanisms for solving technical problems. For the specialty 6-05-0714-03 "Engineering and technical design and production of materials and products from them": - To master the methods of modeling geometric and kinematic relationships in mechanisms and on its basis to be able to synthesize mechanisms for solving various technical problems. - To know the basic theoretical principles of statics, kinematics and dynamics of mechanical systems, to know the methods of calculating stability and vibrations of static and dynamic systems. For the specialty 6-05-0713-04 "Automation of technological processes and productions": -To master the methods of modeling geometric and kinematic connections in mechanisms and on its basis to be able to synthesize mechanisms for solving various technical problems. -To know the basic theoretical principles of statics, kinematics and dynamics of mechanical systems, to know the methods of calculating stability and vibrations of static and dynamic systems. For the specialty 6-05-0722-05 "Production of products based on three-dimensional technologies":-Have the skills to build and calculate dynamic models of mechanisms and machines.

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

The current certification is carried out in the form of a written lecture survey, oral defense of laboratory work. The intermediate certification is conducted in the form of an examination in writing. The exam ticket includes two theoretical questions and one task. The defense of the course work is conducted orally.