

THEORY OF MECHANISMS AND MACHINES

(course title)

COURSE SYLLABUS ABSTRACT

Specialty 1-53 01 01 – "Automation of technological processes and productions"

	full-time
Year	2,3
Semester	4,5
Lectures, hours	50
Practical classes (seminars), hours	16
Laboratory classes, hours	16
Course paper, semester	5
Exam, semester	4
Contact hours	82
In-class test (semester, hours)	
Independent study, hours	38
Total course duration in hours / credit units	120/3

1. Course outline

The objectives of the discipline are to study the basics of the structure of mechanisms, numerical methods in solving equations of motion, force analysis, friction and wear in mechanisms, synthesis of lever, cam, gear mechanisms, intermittent motion mechanisms, control systems of automatic machines and their design, the structure of manipulators and industrial robots, kinematic and dynamic analysis of manipulators; motion research machines and mechanisms with elastic links, vibrations in mechanisms and machines; mathematical modeling of the movement of machines and mechanisms with rigid connections and geometric and kinematic connections in mechanisms.

2. Course learning outcomes

to know:

- the basic theoretical provisions of the structure, kinematics, dynamics and control of machine systems, individual machines and mechanisms, their components, 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;
- fundamentals of the structure of mechanisms;

be able to:

- make calculation schemes (models) 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;
- to conduct research on the movement of machines and mechanisms with elastic links;

possess:

- the 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. Competencies

SK-3.1 – Possess methods of modeling geometric and kinematic connections in mechanisms and on its basis be able to synthesize mechanisms for solving various technical problems.

4. Requirements and forms of midcourse evaluation and summative assessment

- oral; oral-written.
- interviews;
- reports on practical classes;
- reports on classroom practical work with their oral defense;
- reports on home practical work with their oral defense;
- protection of laboratory work.