

Methods of physical and technical processing

(course title)

COURSE SYLLABUS ABSTRACT

1-36 01 03 – Machine-building process equipment

(speciality code and name)

	STUDY MODE
	full-time
Year	4
Semester	8
Lectures, hours	36
Practical classes (seminars), hours	18
Laboratory classes, hours	18
Exam, semester	8
Contact hours	72
Independent study, hours	38
Total course duration in hours / credit units	110/3

1. Course outline

Material cutting theory. Physical foundations of the cutting process. Optimization of the cutting process. Serviceability and failures of the cutting tool. Generates the surface layer properties of machined parts. Beam processing methods. Chemical processing methods. Finishing methods of physical and technical processing. Ion-plasma processing of structural and instrumental materials.

2. Course learning outcomes

Upon completion of the course, students will be expected to

know: theoretical foundations, methods of modeling and experimental study of processes of physical and technical processing, including processes of combined processing with the application of various physical and chemical effects; physical and chemical phenomena occurring in the area of interaction between the tool and the workpiece; the physical basis of the cutting process; geometric, kinematic, dynamic, tribological and other features of widely used methods of material processing in production; mechanisms for forming quality of treated surfaces; methods of optimizing process parameters in order to improve performance, quality and cost-effectiveness of processing, as well as reduce power consumption;

be able to: simulate the processes of physical and technical processing, technological equipment and cutting tools during the formation of surfaces of machine parts; Optimize process parameters to improve processing performance, quality and cost-effectiveness, and reduce power consumption predict and create technological processes of physical and technical processing, equipment and tools based on new physical effects;

possess: basis of design of technological processes of physical and technical processing; methods of monitoring physical and technical processing processes.

3. Competencies

SK-12 – Be able to design the processes of physical and technical processing of parts.

4. Requirements and forms of midcourse evaluation and summative assessment

– verbal-written: protection of practical classes, laboratory protection, exam.