ADDITIVE MANUFACTURING TECHNOLOGIES
COURSE SYLLABUS ABSTRACT

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

	STUDY MODE
	full-time
Year	3,4
Semester	6,7
Lectures, hours	68
Practical classes (seminars), hours	32
Laboratory classes, hours	32
Course project, semester	7
Pass/fail, semester	6
Exam, semester	7
Contact hours	132
Independent study, hours	136
Total course duration in hours / credit units	268/8

1. Course outline

Types of additive technologies, theoretical foundations of processes (rheology, heat transfer, surface phenomena, structure formation). Production taking into account various model materials (liquid, bulk, powder, polymer, metal, melts, solutions, etc.). Production and technological characteristics of premixes, prepregs, powder, rod and granular materials. Consolidation in shaping processes (compaction, fusion, curing). The main methods of forming products using three-dimensional production technologies, calculation of parameters and applications. Ensuring the adhesive connection of products with the substrate and between its individual auxiliary elements. Three-dimensional technologies for the production of hybrid composite products and subassemblies.

2. Course learning outcomes

Upon completion of the course, students will be expected to

know: - the theoretical foundations of the processes of forming products using three–dimensional technologies; – the main technological operations during the shaping and refinement of products; - methods of calculation and modeling of the processes of forming products, the technical standards used in this case.

be able to: – choose suitable technological processes for obtaining products; – calculate the parameters of typical technological processes of forming products using three-dimensional technologies and work them out in experimental industrial conditions; – evaluate the manufacturability of the design of products according to economic criteria.

possess a skill to: – select the process of three-dimensional production according to technical and economic indicators, taking into account energy and resource conservation; - develop technological and related documentation; – analytical assessment, forecasting and pilot testing of the parameters of the processing process and technological properties of materials; ensure the structure and operational properties of materials at the stage of forming products.

3. Competencies

Select and develop technological processes of additive synthesis, calculate their technological parameters. Master the basics of research, search, analyze and synthesize information. Be capable of self-development and self-improvement in professional activities. Take initiative and adapt to changes in professional activities. Master the basics of calculating and designing equipment and special technological equipment for three-dimensional technologies.

4. Requirements and forms of midcourse evaluation and summative assessment

The defense of laboratory work is carried out orally.

The test and the exam are conducted in writing in the form of answers to test questions.