

## Additive technologies

(course title)

### **COURSE SYLLABUS ABSTRACT**

1-40 05 01 Information systems and technologies (majors in)

(speciality code and name)

1-40 05 01-01 Information systems and technologies (in designing and producing)

(specialisation code and name)

	STUDY MODE	
	full-time	part-time (shortened program)
Year	3	3
Semester	6	6
Lectures, hours	34	6
Practical classes (seminars), hours	16	4
Exam, semester	6	6
Contact hours	50	10
Independent study, hours	58	98
Total course duration in hours / credit units	108/3	

#### 1. Course outline

Classification of 3D printing technologies. Extrusion methods of 3D printing. Powder 3D printing methods. Inkjet 3D printing methods. Multi-stage and continuous 3D printing by photopolymerization.

#### 2. Course learning outcomes

Upon completion of the course, students will be expected to

know: the main stages of creating three-dimensional objects by additive production methods, methods for preliminary optimization of three-dimensional objects, the main errors that arise during the preparation of a three-dimensional model, as well as methods for their elimination, existing object construction algorithms, basic three-dimensional printing technologies and the physical principles underlying them.

be able to: select the most appropriate 3D printing method based on the physical principles and limitations of the method, use the software to pre-check the 3D model and correct errors, position the model and build supporting structures in accordance with the printing methods used, select parameters and printing algorithms depending on the material used and the type of object.

possess: skills in analyzing the task of manufacturing a given three-dimensional object, identifying problem areas during the subsequent manufacture of the object by additive production methods, selecting the most suitable three-dimensional printing methods in accordance with, selecting the most suitable parameters, materials and printing algorithms, correcting triangulation errors during the preparation of the model for the printing process, printing on commercially available three-dimensional printers of the FDM and SLA/DLPc class.

#### 3. Competencies

AK-1 – Be able to apply basic scientific and theoretical knowledge to solve theoretical and practical problems; AK-2 – Own system and comparative analysis; AK-3 – Own research skills; AK-4 – Be able to work independently; AK-5 – Be able to generate new ideas (have creativity); AK-6 – Have a multidisciplinary approach to problem solving; AK-7 – Have skills related to the use of technical devices, information management and computer work; AK-8 – Have oral and written communication skills; AK-9 – Be able to study, improve your qualifications throughout your life; AK-10 – Use the basic laws of natural sciences in your professional activity; AK-11 – Own the main methods, methods and means of obtaining, storing, processing information using computer equipment; AK-14 – Organize your work on a scientific basis, independently evaluate the results of your work; SLK-5 – Be capable of criticism and self-criticism; SLK-6 – Be able to work in a team; PK-3 – Analyze and justify the selection of technical, software and systems for automated support of professional activities; PK-31 – Design new and modernize technological processes that ensure the required technical and economic indicators.

#### 4. Requirements and forms of midcourse evaluation and summative assessment

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