

**Subject card**

<b>Subject name and code</b>	Designing with elements of rapid 3D prototyping, PG_00121149						
<b>Field of study</b>	Chemical Business, Chemistry, Environmental Protection						
<b>Date of commencement of studies</b>	October 2026		<b>Academic year of realisation of subject</b>			2027/2028	
<b>Education level</b>	Master's studies		<b>Subject group</b>			Optional subject group	
<b>Mode of study</b>	full-time studies		<b>Mode of delivery</b>			at the university	
<b>Year of study</b>	2		<b>Language of instruction</b>			English	
<b>Semester of study</b>	3		<b>ECTS credits</b>			4.0	
<b>Learning profile</b>	academic		<b>Assessment form</b>			credit	
<b>Conducting unit</b>	Department of Environmental Technology -> Faculty of Chemistry -> Rector						
<b>Name and surname of lecturer (lecturers)</b>	<b>Subject supervisor</b>		dr inż. Paweł Mazierski				
	<b>Teachers</b>						
<b>Lesson types</b>	<b>Lesson type</b>	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	<b>Number of study hours</b>	30.0	0.0	0.0	0.0	0.0	30
	E-learning hours included: 0.0						
<b>Learning activity and number of study hours</b>	<b>Learning activity</b>	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	<b>Number of study hours</b>	30		5.0		65.0	100
<b>Subject objectives</b>	- Designing with elements of rapid 3D prototyping. The course aims to provide the fundamental knowledge of the design, prototyping and fabrication of chemical apparatus using 3D printing technology						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[CHEMMU2_U03] Finds necessary information in specialist literature, databases and other sources, lists basic scientific journals in chemistry.	- uses engineering terminology	[SU1] oral statement/conversation/discussion [SU2] presentation/project/paper/report
	[CHEMMU2_W05] Has extended knowledge in the field of the specialisation studied.	- knows the engineering software for design and 3D modeling - lists the components of a 3D printer - is able to work in the concept design system	[SW2] presentation/project/paper/report
	[CHEMMU2_W10] Uses knowledge of the principles of operation of the basic scientific and research apparatus used in chemistry.	- knows the rules of technical drawing	[SW2] presentation/project/paper/report
	[CHEMMU2_K06] Undertakes research tasks consciously and responsibly, understanding the social aspects of the practical application of the acquired knowledge and skills and the responsibility related to it.	- cooperate in group, taking different roles - understand social aspects of practical use of knowledge and abilities as well as connected with them responsibility	[SK1] oral statement/conversation/discussion [SK8] observation of student's independent or team work
	[CHEMMU2_K03] Understands the need for systematic work on various projects of a long-term nature and knows how to set priorities for the implementation of undertaken tasks.	- exhibit creativity in determination of priorities necessary for realization of different tasks	[SK1] oral statement/conversation/discussion [SK8] observation of student's independent or team work
	[CHEMMU2_K01] Knows the limitations of her/his own knowledge; understands the need for further education and can inspire other people to do so.	- understand need for learning - inspire other for learning	[SK1] oral statement/conversation/discussion [SK2] presentation/project/paper/report [SK8] observation of student's independent or team work
	[CHEMMU2_U09] Has deepened ability to prepare various forms of oral presentations on chemistry in Polish and English.	- uses engineering software for 3D modeling - prepares technical documentation	[SU1] oral statement/conversation/discussion [SU2] presentation/project/paper/report [SU8] observation of student's independent or team work
Subject contents	The student will get acquainted with the necessary steps to finalize a product, which helps in realization of a conceptual design. The student will learn all the steps to be taken from the idea to its finalization as well as the software for creating 3D models. Finally, the course includes the production of small laboratory equipment using a 3D printer.		
Prerequisites and co-requisites	lack		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Project	51.0%	100.0%
Recommended reading	Basic literature	- Kamrani, Ali K.; Nasr, Emad Abouel - Rapid Prototyping theory and practice	
	Supplementary literature	- Bhowmik, Sumit - Modeling and Optimization of Advanced Manufacturing Processes	
	eResources addresses		
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		

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