



Subject card

Subject name and code	Introduction to Modern Polymer Technologies, PG_00060885						
Field of study	Chemical Technology						
Date of commencement of studies	October 2024	Academic year of realisation of subject				2026/2027	
Education level	first-cycle studies	Subject group				Optional subject group Subject group related to scientific research in the field of study	
Mode of study	Full-time studies	Mode of delivery				at the university	
Year of study	3	Language of instruction				Polish	
Semester of study	5	ECTS credits				3.0	
Learning profile	general academic profile	Assessment form				assessment	
Conducting unit	Department of Polymer Technology -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Justyna Kucińska-Lipka				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan		Participation in consultation hours		Self-study	SUM
	Number of study hours	30		5.0		40.0	75
Subject objectives	The course aims to familiarize students with modern polymer technologies. The course will cover the basic groups of polymers, including their properties, processing technologies, and applications. In addition to conventional processing technologies such as injection molding and extrusion, significant emphasis will be placed on technologies such as 3D printing.						
Learning outcomes	Course outcome		Subject outcome			Method of verification	
	[K6_W05] has knowledge of chemical technology based on mineral or energy resources and modern energy sources, understands the concept of sustainable development, knows the principles of green chemistry and environmentally friendly process engineering, has knowledge of occupational safety in the chemical industry		The student has knowledge of the raw materials used in the plastics industry and is able to indicate the use of the concept of sustainable development and the principles of green chemistry and technology in the plastics industry.			[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge	
	[K6_W09] has knowledge of the technological and functional properties of polymers, the physical basis and processing methods of polymers and rubber		The student has knowledge of the technological and functional properties of polymers and methods of processing polymers and rubber.			[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge	
	[K6_U02] is able to operate typical laboratory apparatus and conduct analyses related to materials testing		The student is able to use laboratory and industrial apparatus, equipment, and machines used in chemistry and polymer technology.			[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment	

Subject contents	Course content – lecture <ul style="list-style-type: none"> • Introduction to Polymer Technology • Polymers and Plastics. • Technological and Functional Properties of Polymers • Overview of General Purpose Polymers • Special Purpose Engineering Polymers • Thermoplastic Processing Technologies: Injection Molding • Thermoplastic Processing Technologies: Extrusion • Thermoplastic Processing Technologies: 3D Printing • Biobased and Biodegradable Polymer Technologies • Thermoset Technologies: Polyester, Epoxy, Phenolic, and Urea Resins • Rubber Processing Technologies • Rubber Recycling Technologies • Plastic Recycling Technologie 			
	Course content – laboratory <ul style="list-style-type: none"> • Polymer and plastic identification methods: flame testing, calcination, instrumental techniques • Thermoplastic melt flow index and 3D printing • Thermoplastic processing technologies: injection molding and extrusion • Cast and foamed polyurethane technologies 			
Prerequisites and co-requisites				
Assessment methods and criteria		Subject passing criteria	Passing threshold	Percentage of the final grade
		laboratory: attendance and work during classes, reports	100.0%	40.0%
		lecture: written test	60.0%	60.0%
Recommended reading	Basic literature	<ul style="list-style-type: none"> • K. Wilczyński: <i>Przetwórstwo tworzyw sztucznych</i>, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2020 • M. Strankowski, J. Gołąbek J., J. Datta, K. Formela: <i>Podstawy technologii przetwórstwa materiałów polimerowych</i>, Wydawnictwo Politechniki Gdańskiej, Gdańsk 2024 		
	Supplementary literature	<ul style="list-style-type: none"> • M. Chanda: <i>Plastics Technology Handbook</i>, CRC Press, 2019 • E. Baur, T.A. Osswald, N. Rudolph: <i>Plastics Handbook. The Resource for Plastics Engineers</i>, Hanser Publications, 2019 		
	eResources addresses			
Example issues/ example questions/ tasks being completed	<ul style="list-style-type: none"> • Explain the difference between polymers and plastics. • Describe and provide examples of thermoplastics, elastomers, and thermosets. • List and describe thermoplastic processing technologies. • Discuss plastics recycling technologies. 			
Practical activities within the subject	Not applicable			

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