



Subject card

Subject name and code	Chemistry of Polymers, PG_00061914						
Field of study	Materials Engineering						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2024/2025		
Education level	first-cycle studies		Subject group		Obligatory subject group in the field of study 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	2		Language of instruction		Polish		
Semester of study	4		ECTS credits		3.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Polymer Technology -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Justyna Kucińska-Lipka				
	Teachers		dr inż. Maciej Sienkiewicz				
			dr inż. Krzysztof Formela				
			dr inż. Paulina Parcheta-Szwindowska				
			dr inż. Marcin Włoch				
			dr inż. Ewa Głowińska				
		dr hab. inż. Justyna Kucińska-Lipka					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	30.0	0.0	0.0	60
	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	60		5.0		10.0	75
Subject objectives	The aim of the course is gaining knowledge of the structure, properties and synthesis methods polymers of practical importance						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U05] can learn independently	The student prepares theoretically for classes	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information
	[K6_K01] Understands the need to improve professional and personal competencies; is conscious of own limitations and knows when to turn to experts, properly establishes priorities helping to accomplish tasks defined by oneself or others.	The student knows how to improve his/her own competences and knows when to turn to experts for help, is able to appropriately define priorities for the implementation of tasks defined by himself/herself or others.	[SK3] Assessment of ability to organize work [SK5] Assessment of ability to solve problems that arise in practice
	[K6_U01] Can properly use selected analytical, simulation and experimental methods, as well as devices for measuring the fundamental properties of materials and technological processes.	The student is able to use analytical methods and devices enabling the measurement of basic quantities characterizing materials and synthesis processes.	[SU4] Assessment of ability to use methods and tools
	[K6_W02] has knowledge of physics and chemistry, useful for formulating and solving simple problems within the scope of materials science	The student has knowledge of physics and chemistry useful for solving problems related to the synthesis of polymers and the interpretation of their properties.	[SW1] Assessment of factual knowledge
Subject contents	LECTURE: Basic concepts: monomers, oligomers, homopolymers, copolymers, terpolymers, polymer materials. Division of monomers and polymers. Types of polyreactions. Radical polymerization, initiators and chemical reactions occurring in the processes of initiation, growth and termination of chains - kinetics. Polymers produced by radical polymerization. Anionic polymerization of selected monomers. Polymers produced in anionic polymerization. Condensation polymerization: homopolycondensation, heteropolycondensation, copolycondensation and cross-linking polycondensation. Chemical reactions occurring in polycondensation processes leading to the production of polymers of practical use. LABORATORY: Radical polymerization: polymerization of methyl methacrylate in mass Radical polymerization: polymerization of methyl methacrylate in suspension and emulsion Polyaddition: synthesis of elastomers and polyurethane foams Polycondensation: Polyamide 6.6 and 6.10 Technology of elastomers and latex products Chemical modification of polymers: obtaining poly(vinyl alcohol) from poly(vinyl acetate) Chemistry and technology of epoxy resins Polymer hydrogels Reactive molding technology		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		100.0%	25.0%
		50.0%	25.0%
		50.0%	50.0%
Recommended reading	Basic literature	Z. Florjańczyk i S. Penczka: Chemia polimerów, T1. Makrocząsteczki i metody ich otrzymywania, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2001 J. Pielichowski, A. Puszyński: Chemia polimerów, WNT Kraków 2004	
	Supplementary literature	- W.C. Callister, D.G. Rethwisch: Materials Science & Engineering, 10th Edition, John Wiley & Sons, New York 2020 - Polish and foreign scientific journals	
	eResources addresses	Adresy na platformie eNauczanie: Chemia polimerów (PG_00061914) - Moodle ID: 43676 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=43676	
Example issues/ example questions/ tasks being completed	What are: monomers, oligomers, homopolymers, copolymers, terpolymers, polymeric materials?Division of monomers and polymers. Types of polyreactions.		
Work placement	Not applicable		

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