



Subject card

Subject name and code	Design of Polymer Materials , PG_00049203									
Field of study	Chemistry									
Date of commencement of studies	October 2020		Academic year of realisation of subject		2022/2023					
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 Polymers Technology -> Faculty of Chemistry									
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Michał Strankowski							
	Teachers		dr inż. Paulina Parcheta-Szwadowska dr hab. inż. Michał Strankowski							
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM			
	Number of study hours	30.0	0.0	15.0	0.0	0.0	45			
	E-learning hours included: 0.0									
Address on the e-learning platform: https://teams.microsoft.com/l/meetup-join/19%3ameeting_Y2U5ZGEyNDAtZjcyYS00NWZILWlyNjlTZjMzYTEwZGM2MTg1%40thread.v2/0?context=%7b%22Tid%22%3a%2286760356-0022-486f-b793-a2d470bba5a5%22%2c%22Oid%22%3a%22a341d16c-97c6-4f63-a523-16e23d4c5ce5%22%7d										
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	45		5.0		25.0	75			
Subject objectives	The aim of this course is to familiarize students with the latest tools for designing polymer materials. In particular, there will be presented some solutions based on computer simulations and applications allowing to predict the properties of polymeric materials.									

Learning outcomes	Course outcome	Subject outcome	Method of verification									
	[K6_U01] knows how to get information from literature, databases and other sources, can integrate the information obtained, interpret and critically evaluate it, and draw conclusions, and to formulate and justify the opinions	The student is actually looking for useful information aimed at understanding the technological process.	[SU2] Assessment of ability to analyse information									
	[K6_U06] can analyze the functioning of equipment, apparatus and technology lines used in laboratories and chemical industry, and can recognize and propose methods to solve the simple engineering tasks which he can meet as an Engineer and select and use routine methods, chemical apparatus and tools to solve practical engineering tasks, including also technological processes; can himself/herself read and make technical drawings using CAD software	The student skilfully uses the tools and apparatus used in the processing of polymeric materials.	[SU4] Assessment of ability to use methods and tools									
	[K6_W07] has knowledge about basic polireactions making possible the production of various macromolecular compounds, including the idea of creating blends and polymer composites for specific applications	The student has knowledge and skills related to the development of new polymer materials, also reinforced polymeric materials.	[SW1] Assessment of factual knowledge									
Subject contents	Design of polymeric materials, their properties and applications. Computer simulations using Autodesk Moldflow software. Economic analysis and the design of polymeric materials.											
Prerequisites and co-requisites	Basic knowledge of the types and properties of polymers and the application of plastics materials.											
Assessment methods and criteria	<table border="1"> <thead> <tr> <th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr> </thead> <tbody> <tr> <td>Laboratory tests</td><td>60.0%</td><td>50.0%</td></tr> <tr> <td>Lecture tests</td><td>60.0%</td><td>50.0%</td></tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Laboratory tests	60.0%	50.0%	Lecture tests	60.0%	50.0%
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Recommended reading	Basic literature Computer design of products made of polymeric materials (using Moldflow Plastic Insight). 1. Sikora R.: Przetwórstwo tworzyw wielkocząsteczkowych, WE, Warszawa, 1993. 2. Przetwórstwo tworzyw sztucznych, Praca zbiorowa pod redakcją K. Wilczyńskiego, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2000. 3. Smorawiński, Technologia wtrysku, WNT Warszawa 1984. 4. Osswald T.A., Baur E., Brinkmann S., Oberbach K., Schmachtenberg E.: International Plastics Handbook, Hanser Publishers, Munich 2006.											
	Supplementary literature Mechanik 2013 R. 86, nr 3 218, 220, 222, 224Techniki wspomagania projektowania wyrobów z tworzyw sztucznych. Aplikacja do doboru tworzyw polimerowych do wybranych zastosowań Szczerba, J.											

	eResources addresses	<p>Podstawowe</p> <p>https://www.youtube.com/watch?v=PIQPYAc8czc&list=PLzzbXI2R-R7X_28i_SMek9L-STfZjcSoN&index=4 - Autodesk Moldflow Adviser - Tutorial 4</p> <p>https://www.youtube.com/watch?v=mGGu2kK1LtA&list=PLzzbXI2R-R7X_28i_SMek9L-STfZjcSoN&index=3 - Autodesk Moldflow Adviser - Tutorial 3</p> <p>https://www.youtube.com/watch?v=_m-jnlzwwol&list=PLzzbXI2R-R7X_28i_SMek9L-STfZjcSoN&index=2 - Autodesk Moldflow Adviser - Tutorial 2</p> <p>https://www.youtube.com/watch?v=bU-LvoNOHAM - Autodesk Moldflow Adviser - Tutorial 1</p> <p>Adresy na platformie eNauczanie:</p> <p>Projektowanie wyrobów polimerowych - Moodle ID: 24449 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=24449</p>
Example issues/ example questions/ tasks being completed		<ol style="list-style-type: none"> 1. Main principles used in the construction of plastic elements. 2. Comparison of different polymer materials. 3. Selection of the polymer materials depending on the application.
Work placement		Not applicable