



Subject card

Subject name and code	Biomaterials processing and testing methods, PG_00053274						
Field of study	Mechanical and Medical Engineering						
Date of commencement of studies	February 2024	Academic year of realisation of subject			2024/2025		
Education level	second-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			English		
Semester of study	2	ECTS credits			2.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Chemistry, Technology and Biochemistry of Food -> Faculty of Chemistry						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Agata Sommer				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	15.0	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		0.0		0.0	30
Subject objectives	Acquainting with the biological and chemical characteristics of biopolymers in terms of various methods of obtaining biomaterials.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W09] He/she in-depth knowledge related to diagnosis techniques and medical procedures in the scope of the field of study of mechanical-medical engineering		The student has knowledge of instrumental techniques and biological and chemical methods of testing biomaterials.		[SW1] Assessment of factual knowledge		
	[K7_U13] He/she uses in-depth knowledge related to the diagnoses techniques and medical procedures in the scope of the field of study of mechanical-medical engineering		Students can classify polymers and select an appropriate method of processing and testing biomaterials.		[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment		
	[K7_U82] is able to proficiently obtain and process information related to field of study and academic environment in foreign language at B2+ level of the Common European Framework of Reference for Languages (CEFR)		Students can independently perform literature studies, search patent databases and expand their knowledge in the field of biomaterials application.		[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools		
	[K7_K82] is equipped to participate actively in lectures, seminars and laboratory classes conducted in foreign language		Preparation for active participation in lectures, seminars, laboratories conducted in a foreign language.		[SK2] Assessment of progress of work [SK4] Assessment of communication skills, including language correctness [SK3] Assessment of ability to organize work		
Subject contents	The topics of the lectures will be related to the characteristics of the chemical and biological properties of biomaterials. Students learn about instrumental methods of biomaterials assessment (including chromatographic and spectroscopic) and the importance of <i>in vivo</i> and <i>in vitro</i> tests in biocompatibility and biodegradation tests. The second part of the lectures will cover the currently used methods of biopolymer processing, including 3D printing. During the seminar, students will give presentations on topics including, inter alia, relations between the chemical structure and the properties of biomaterials, artificial organs, ethical aspects of implantology.						
Prerequisites and co-requisites							

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Presentation	60.0%	40.0%
	Lecture colloquium	60.0%	60.0%
Recommended reading	Basic literature	Current scientific literature covering the subject matter as given by the lecturers	
	Supplementary literature	Current scientific literature covering the subject matter as given by the lecturers	
	eResources addresses	Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	<p>1. Match the name of polymer to its chemical structure. 2. List the advantages/disadvantages of polymeric biomaterials. 3. Characterize techniques used to determine the molecular weight of polymer. 4. List polymers used as bioinks. 5. List the steps of biocompatibility testing. 6. Which factors need to be considered during <i>in vivo</i> evaluation of biomaterials biocompatibility?</p>		
Work placement	Not applicable		