



COURSE DESCRIPTION CARD

Course name	Destruction Processes of Medical Materials				
Course type	optional	Course code	SDPB0133	ECTS credits	2
Forms and number of hours	lecture: 10 h project: 10 h	Scientific discipline	biomedical engineering		
Course objectives	Knowledge: Familiarizing PhD students with selected issues of the destruction of medical materials and the practical significance of these processes. Deepening knowledge in the field of identifying the causes of destruction and methods of counteracting them. Familiarizing with modern methods of microscopic observation and testing the properties of medical materials in terms of assessing the destruction processes. Skills: Developing skills in selecting medical materials in the context of ensuring their maximum durability, depending on the target application. Social competences: Acquiring competences to improve professional qualifications in the field of the destruction of medical materials.				
Course content	The concept and classification of destruction processes of materials used for medical applications. Characteristics of the destruction process of biomaterials in the biological environment of the body. Chemical and electrochemical corrosion. Stress and microbiological corrosion. Erosive destruction processes. Electroerosion. Cavitation and cavitation wear. Tribological wear. Biological destruction processes. Aging of materials. Structural degradation. Methods of correct design of materials for medical applications and methods of monitoring destruction processes using microscopic techniques, mechanical and tribological tests, spectroscopic techniques, and physicochemical, rheological, corrosion, and biological methods.				
Teaching methods	Informative and problem-based lecture enriched with discussion with the audience, multimedia presentation, project.				
Assessment method	Lecture: written test. Project: development of a method for assessing the destruction processes for a selected case of medical material.				
Symbol of learning outcome	Learning outcomes		Reference to the learning outcomes for the field of study for the 8 th level of Polish Qualification Framework (PRK)	Methods of assessing the learning outcomes	
LO1	Knows the processes of destruction of medical materials.		SD_W1	Test	
LO2	Can formulate the conditions for the occurrence of destruction processes.		SD_W3	Test	
LO3	Can develop methods to prevent the destruction of medical materials.		SD_U1	Project	
LO4	Knows research methods and is able to apply methods to solve selected issues related to the destruction of medical materials.		SD_K1	Project	



Student workload (in hours)	
Lecture / classes / project / laboratory / seminar	10 / 0 / 10 / 0 / 0
Consultations	2
The unassisted student work	20
Implementation of project tasks and preparation for and participation in exams/tests	8
Total	50
ECTS credits	2

Basic references	1. Bućko S. et al., Selected issues of analysis of destruction patterns of materials and structures, Cracow University of Technology Publishing House, Cracow 2021. 2. Kubiński W., Selected methods of testing materials, PWN, Warsaw 2016. 3. Marciniak J., Biomaterials, Silesian University of Technology Publishing House, Gliwice 2013. 4. Malinowska-Pańczyk E. (ed.), Sommer A., Filipkowski P., Introduction to biocorrosion, Gdańsk University of Technology Publishing House, Gdańsk 2021.
Supplementary references	1. Baszkiewicz J. Kamiński M., Corrosion of materials, Warsaw University of Technology Publishing House, Warsaw 2006. 2. Leda H., Engineering materials in biomedical applications, Poznań University of Technology Publishing House, Poznań 2012.
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