

COURSE DESCRIPTION CARD

Course name	Advanced methods of medical material research				
Course type	optional	Course code	SDPB0068	ECTS credits	1
Forms and number of hours	lecture: 10 h	Scientific discipline	all		
Course objectives	Lecture – 10 h Scientific discipline – Materials engineering, Biomedical engineering ECTS Points - 1				
Course content	Program contents: 1. Crystallography and selected issues of the structure of matter; 2. Phase studies using X-ray Diffraction Pattern (XRD); 3. Electron microscopy - principle of operation (FIB-SEM, STEM, SEM-EBSD, SADP); 4. Sample preparation used in SEM and TEM; 5. Methods of chemical analysis of materials (XRF, FTIR spectrometry, gas chromatography, among others).				
Teaching methods	Multimedia lectures enriched with discussion with the audience, and students' own studies based on the indicated sources.				
Assessment method	Lecture – written exam (credit)				
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	The student knows and understands to the extent that it is possible to revise the existing paradigms - world achievements, including theoretical foundations and general issues and selected specific issues - appropriate for a given scientific or artistic discipline.		SD W1	Egzamin	
LO2	The student is able to use knowledge from various fields of science or art to creatively identify, formulate and innovatively solve complex problems or perform research tasks, in particular: – define the purpose and subject of research, formulate a research hypothesis, – develop research methods, techniques and tools and use them creatively, make conclusions based on the results of scientific research.		SD U1	Egzamin	

L03	The student is able to make a critical analysis and evaluation of the results of scientific research or expert activity and other creative works and their contribution to the development of knowledge.	SD U2	Egzamin
L04	The student is ready to critically evaluate the achievements of a given scientific or artistic discipline; to critically evaluate one's own contribution to the development of a given scientific or artistic discipline; to recognize the importance of knowledge in solving cognitive and practical problems.	SD K1	Egzamin

Student workload (in hours)	
Lecture	10
Consultations	1
The unassisted student work	10
Implementation of project tasks and preparation for and participation in exams/tests	5
Total	26
ECTS credits	1

Basic references	1. A. Barbacki; Mikroskopia elektronowa, Wydawnictwo Politechniki Poznańskiej wydanie III 2007. 2. Szummera; Podstawy ilościowej mikroanalizy rentgenowskiej, WNT 1994. 3. D. B. William, C. B. Carter; Transmission elektron microscopy, Springer 2009. 4. J. Gubicza; X-Ray line profile analysis in material science, IGI Global.
Supplementary references	1. M. ASHBY, Inżynieria materiałowa T. 1, T.2, Wydawnictwo Galaktyka 2011. 2. V. Pecharsky, P. Zavalij; Fundamentals of Powder Diffraction and Structural Characterization of Materials, 2003.
Author of the programme	Dr hab. Inż. Zbigniew Oksiuta, prof. PB
Date of issuing the programme	10.03.2021