COURSE DESCRIPTION CARD

Course name	**Physical basis of experimental methods**				
Course type	**optional**	**Course code**	**SDPB0001**	**ECTS credits**	**2**
Forms and number of hours	**lecture: 10 h** **lab: 10 h**	**Scientific discipline**	**mechanical engineering; biomedical engineering; civil engineering and transportation; automatics, electronics and electrical engineering; environmental engineering, mining and energy**		
Course objectives	Knowledge: Showing that the essence of the experimental determination of any parameter is the physical law. Acquainting with advanced methods of apparatus research. Skills: Developing the ability to carry out experimental research with particular emphasis on the knowledge of the physical foundations of the processes under study. Social competences: Acquiring competences to look critically at the results of experimental research.				
Course content	1. Place of experimental methods in the methodology system. 2. Characteristics of modern methods of experimental research. 3. Measurement and experiment as basic tools of experimental methods. 4. Physical foundations of research methods with particular emphasis on optical interference and spectroscopic methods.				
Teaching methods	Lecture enriched with discussion with the audience. Laboratory exercises covering the student's independent work.				
Assessment method	Lecture: written test; Laboratory: assessment of entrance tests, reports, discussions and activity in the classroom.				

Symbol of learning outcome	**Learning outcomes**	**Reference to the learning outcomes for the field of study for the 8th level of Polish Qualification Framework (PRK)**	**Methods of assessing the learning outcomes**
LO1	Knows the issues of physics underlying experimental research.	SD_W1	Test
LO2	Knows the basic experimental methods used in apparatus research.	SD_W3	Test
LO3	Can use appropriate methods and experimental tools typical for the field of research used.	SD_U1	Exercise report
LO4	Is ready to critically evaluate the results of experimental research.	SD_K1	Exercise report

Student workload (in hours)	
Lecture / laboratory	10 / 10
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. M. Korzyński, *Metodyka eksperymentu: planowanie, realizacja i statystyczne opracowanie wyników eksperymentów technologicznych*, WNT, 2013; 2. M. Czarnocka, *Doświadczenie w nauce*, Wydawnictwo Instytutu Filozofii i Socjologii PAN, 1992 3. R. Gilat, L. Banks-Sills, *Advances in Mathematical Modeling and Experimental Methods for Materials and Structures*, Springer Netherlands, 2010
Supplementary references	1. C. A. Sciamarella, F. Sciamarella, *Experimental Mechanics of solids*, Wiley, 2012 2. S. Ochelski, *Metody doświadczalne mechaniki kompozytów konstrukcyjnych*, WNT, 2004 Z. 3. Hubicki, *Nauka i przemysł: metody spektroskopowe w praktyce, nowe wyzwania i możliwości*, Wydawnictwo UMCS, 2018
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