

COURSE DESCRIPTION CARD – SPECIMEN

Faculty of Mechanical Engineering									
Field of study								Degree level and programme type	Master's degree
Specialization/ diploma path								Study profile	Mechanical engineering
Course name	Experimental methods in mechanics							Course code	IS-FME-00189W
								Course type	obligatory
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	winter
	15	-	15	-	-	-	-	No. of ECTS credits	5
Entry requirements	mathematics, physics, statics, dynamics, statistic, strength of materials								
Course objectives	Acquire skills in direction to application of different research methods to evaluate the physical properties of materials and mechanical structures. Developing the creative abilities during identification of the properties of physical objects. Application of modern test techniques to analyse of experimental results and to their graphical visualization. Acquire skills in formulating of conclusions.								
Course content	The essence of experimental studies. Strain gauge measurements. Organization of the measurement path. Experimental methods of materials tests in simple stress states: tensile test, compression test, shear test, bending test, torsion test. Testing of materials in complex stress states. Evaluation of the rheological properties of materials- creep and relaxation. Optical test methods in mechanics - photoelasticity, optical and holographic interferometry. Acoustic emission methods and thermography. Non-standard test methods. Laboratory classes: selected methods of thermo-mechanical tests of materials properties and structures.								
Teaching methods	lectures, laboratory classes								
Assessment method	lectures – written exam- test; laboratory classes – evaluation of reports, verification of preparation for classes, tests								
Symbol of learning outcome	Learning outcomes							Reference to the learning outcomes for the field of study	
LO1	Student has knowledge of experimental methods used in mechanics.							M2_W02, M2_W05	
LO2	Student has knowledge of modern technique in experimental mechanics							M2_W08	
LO3	Student correctly formulate research problem and check it experimentally.							M2_U09, M2_U07	
LO4	Student carries out measurements of mechanical quantities							M2_U08	

LO5	Student is able to analyse the results and formulate conclusions.	M2_U20, M2_U08	
LO6	Student can work in team and apply safety rules	M2_K04	
Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed	
LO1	written exam, checking knowledge required to perform laboratory exercises	L, LC	
LO2	written exam,	L, LC	
LO3	laboratory report	L	
LO4	laboratory report	L	
LO5	laboratory report	L	
LO6	laboratory report, observation work in teams	L	
Student workload (in hours)		No. of hours	
Calculation	lecture attendance	30	
	participation in laboratory classes	15	
	preparation for laboratory classes	21	
	working on reports	21	
	participation in student-teacher sessions related to the classes	8	
	preparation for and participation in exams	20	
	TOTAL:	115	
Quantitative indicators		HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation		53	2
Student workload – practical activities		85	3
Basic references	<ol style="list-style-type: none"> Doyle J. F.: Modern experimental stress analysis, John Wiley & Sons Ltd, 2004. Sciammarella C. S., Sciammarella F. M., Experimental Mechanics of Solids, Wiley, 2012. Sharpe W. N.: Springer Handbook of Experimental Solid Mechanics, Springer, 2008. Doyle J. F. Modern experimental stress analysis, John Wiley & Sons Inc. 2016 Ashby M. F. , Jones D. R. H.: Engineering Materials 1,2: 1. An Introduction to properties, applications and design 2. An Introduction to microstructures and processing, Butterworth-Heinemann, 2006. 		
Supplementary references	<ol style="list-style-type: none"> Davis J.R.: Tensile Testing, Materials Park, ASM International, 2004. Kobayashi A.S.: Handbook on experimental mechanics, Prentice-Hall, Inc. N.Y. 1986. Gilat R., Banks-Sills L.: Advances in mathematical modelling and experimental methods for materials and structures, Springer, 2010 Molimard J. Experimental mechanics of solids and structures, John Wiley & Sons Inc. 2016 		
Organisational unit conducting the course	Department of Applied Informatics and Mechanic	Date of issuing the programme	
Author of the programme	Robert Uścińowicz	19 March 2021	

L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work,

S – seminar