

COURSE DESCRIPTION CARD – SPECIMEN

Faculty of Mechanical Engineering									
Field of study								Degree level and programme type	Bachelor's degree
Specialization/ diploma path								Study profile	
Course name	Mathematics I							Course code	IS-MER0006W
								Course type	
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	winter
	45	45						No. of ECTS credits	8
Entry requirements	Mathematics I								
Course objectives	Acquainting with the basics of differential and integral calculus of functions of one variable and preparation for their use in the further education cycle. Acquainting with the basics of vector calculus and methods of linear algebra and preparation for using them in solving engineering problems.								
Course content	Lecture and classes: The function of one variable and its properties. Sequences. Limit and continuity of a function. Derivative of a function. Monotonicity and extremes. Taylor and Maclaurin series. The indefinite integral (integration by parts and by substitution, integration of rational and trigonometric functions). Definite integral and its geometrical applications. Improper integral. Complex numbers. Algebraic, trigonometric and exponential form of a complex number. Vector calculus on the plane and in space. Matrices. Determinant, rank of matrices. Systems of linear equations (Cramer formulas, Gauss elimination).								
Teaching methods	Lecture, classes								
Assessment method									
Symbol of learning outcome	Learning outcomes							Reference to the learning outcomes for the field of study	
LO1	knows, understands and can apply the principles of differentiating the function of one variable to the analysis of the properties of these functions							MK1_W01, MK1_U01	
LO2	understands and correctly applies the laws of logic in the reasoning							MK1_W01, MK1_U01	
LO3	knows and can apply the basics of vector, matrix, algebra of complex numbers							MK1_W01, MK1_U01	

L04	knows and can apply the laws of the integral calculus of one variable in simple calculations	MK1_W01, MK1_U01	
Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed	
L01	test, writing exam	L,C	
L03	test, writing exam	L,C	
L04	test, writing exam	L,C	
L05	test, writing exam	L,C	
Student workload (in hours)		No. of hours	
Calculation	lecture attendance	45	
	participation in classes,	45	
	preparation for classes	46	
	participation in student-teacher sessions related to the classes/seminar/project	5	
	preparation for and participation in exams ad tests	59	
	TOTAL:	200	
Quantitative indicators		HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation		97	3,9
Student workload – practical activities		102	4,1
Basic references	1. J.Stewart, Calculus, 2011, 2. D.A. McQuarrie, Mathematical Methods for Scientists and Engineers, University Science Books, 2003,		
Supplementary references	3. E.W.Swokowski, Calculus with analytic geometry,		
Organisational unit conducting the course	Department of Robotics and Mechatronics	Date of issuing the programme	
Author of the programme	Ewa Pawluszewicz, DSc, Assoc. Prof.	29.03.2021	

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