



## Subject card

Subject name and code	Mathematics II, PG_00039389						
Field of study	Medical and Mechanical Engineering, Medical and Mechanical Engineering						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2020/2021		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			6.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Mathematics Center -> Vice-Rector for Education						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Magdalena Łapińska				
	Teachers		mgr Katarzyna Kiepiela dr inż. Magdalena Łapińska				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	30.0	0.0	0.0	0.0	60
	E-learning hours included: 0.0						
	WM - IMM grupa 1 - Matematyka 2 2020/2021 (K.Kiepiela, M.Łapińska) - Moodle ID: 11549 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=11549">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=11549</a> WM - IMM grupa 2 - Matematyka 2 2020/2021 (K.Kiepiela, M.Łapińska) - Moodle ID: 11550 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=11550">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=11550</a> WM - IMM wykład - Matematyka 2 2020/2021 (K.Kiepiela, M.Łapińska) - Moodle ID: 11548 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=11548">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=11548</a>						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM		
	Number of study hours	60	10.0	80.0	150		
Subject objectives	The aim of this subject is to obtain the student's competence in the range of using the basic methods of mathematical analysis. Furthermore, the student is able to use this knowledge to solve simple theoretical and practical problems that can be found in the field of engineering.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	K6_U01	The student appreciates the importance of expanding knowledge and takes up the challenges associated with working on group problem solving. The student combines knowledge in the field of mathematics with knowledge from other fields.			[SU3] Assessment of ability to use knowledge gained from the subject		
	K6_W01	The student uses basic derivative properties. The student analyzes the properties of the function based on the study of its first and second derivative. The student applies basic formulas and integration techniques to calculate indefinite integrals. The student performs basic operations on complex numbers.			[SW1] Assessment of factual knowledge		
	K6_U05	The student is able to apply the mathematical methods for analysis to solve problems in the field of mechanical and medical engineering.			[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information		

Subject contents	<ol style="list-style-type: none"> <li>1. Definite integrals and its applications.</li> <li>2. Complex numbers.</li> <li>3. Numeric series.</li> <li>4. Elements of linear algebra, systems of linear equations.</li> <li>5. Basic definitions and properties of vectors. Scalar, vector, mixed product - applications.</li> <li>6. Equation of a straight line and a plane in space.</li> <li>7. Functions of many variables. Limit, function continuity, partial derivatives of functions of many variables, extremes of functions of many variables.</li> <li>8. Double integral over rectangle and normal area. Polar coordinates. Applications.</li> <li>9. Triple integral over a cuboid and normal area. Cylindrical and spherical coordinates. Applications.</li> </ol>			
Prerequisites and co-requisites	No recommendations			
Assessment methods and criteria	Subject passing criteria		Passing threshold	Percentage of the final grade
	Written and oral exam		55.0%	100.0%
Recommended reading	Basic literature	G.M. Fichtenholz, Rachunek różniczkowy i całkowy, Tom 1, Wydawnictwo Naukowe PWN, Warszawa 2002, B. Wikiel, Matematyka, Podstawy z elementami matematyki wyższej, Wydawnictwo Politechniki Gdańskiej Gdańsk 2009, K.Jankowska, J.Jankowski, Zbiór zadań z matematyki, Wydawnictwo Politechniki Gdańskiej Gdańsk 2003, W. Krywicki, L. Włodarski Analiza matematyczna w zadaniach część I, PWN, Warszawa 1986.		
	Supplementary literature	<ul style="list-style-type: none"> <li>• Gewert M., Skoczylas Z., "Analiza matematyczna 2. Definicje, twierdzenia, wzory", Oficyna Wydawnicza GiS</li> <li>• Jurlewicz T., Skoczylas Z., "Algebra i geometria analityczna. Definicje, twierdzenia, wzory", Oficyna Wydawnicza GiS</li> <li>• Kajetanowicz P., Wierzejewski J., „Algebra z geometrią analityczną”, Wydawnictwo Naukowe PWN</li> <li>• W. Zakowski, W. Kołodziej, Matematyka część 2 Analiza Matematyczna, Wydawnictwa Naukowo- Techniczne, Warszawa 12003</li> <li>• W. Krywicki, L. Włodarski Analiza matematyczna w zadaniach PWN, Warszawa 1986 W. Stankiewicz Zadania z matematyki dla wyższych uczelni technicznych, PWN, Warszawa 1980</li> <li>• K. Jankowska, T.Jankowski, Funkcje wielu zmiennych, Całki wielokrotne, Geometria analityczna</li> </ul>		
	eResources addresses			
Example issues/ example questions/ tasks being completed	<ol style="list-style-type: none"> <li>1. Calculation of double integrals</li> <li>2. Calculation of triple integrals</li> <li>3. Solving matrix equations.</li> <li>4. Searching for the determinant value.</li> </ol>			
Work placement	Not applicable			