

DESCRIPTION OF THE COURSE OF STUDY

Course code	0541.6.MAT1.C.AM3	
Name of the course in	Polish	Analiza matematyczna III
	English	Mathematical Analysis III

1. LOCATION OF THE COURSE OF STUDY WITHIN THE SYSTEM OF STUDIES

1.1. Field of study	mathematics
1.2. Mode of study	full-time studies
1.3. Level of study	Undergraduate (Bachelor)
1.4. Profile of study*	general academic profile of studies
1.5. Person/s preparing the course description	dr hab. Volodymyr Mykhailiuk
1.6. Contact	volodymyr.mykhailiuk@ujk.edu.pl

2. GENERAL CHARACTERISTICS OF THE COURSE OF STUDY

2.1. Language of instruction	Polish and English
2.2. Prerequisites*	Mathematical Analysis II, Linear Algebra and Geometry

3. DETAILED CHARACTERISTICS OF THE COURSE OF STUDY

3.1. Form of classes	lectures and classes	
3.2. Place of classes	classes in the UJK teaching room	
3.3. Form of assessment	Exam (lectures), graded credit (classes)	
3.4. Teaching methods	Lectures – information lecture Classes - discussions, solving problems	
3.5. Bibliography	Required reading	Robert A. Adams, Christopher Essex; Calculus: Several Variables; Pearson Publishing, 2013.
	Further reading	Serge Lang; Calculus of Several Variables; Springer New York, NY, 1987

4. OBJECTIVES, SYLLABUS CONTENT AND INTENDED LEARNING OUTCOMES

<p>4.1. Course objectives (including form of classes)</p> <p><i>Lectures</i> C1 - basic notions of differential calculus in several variables</p> <p><i>Classes</i> C1 - introduction to differential calculus of maps C2 - finding diffeomorphisms between given domains C3 - sensitize the need to continuously complete the knowledge</p>
<p>4.2. Detailed syllabus (including form of classes)</p> <p><i>Lectures:</i> Space R^n and its topology. Functions of several variables, limits, continuity. Differential calculus in several variables, directional and partial derivatives of the first order, differentiability. Partial derivatives of higher order, Taylor formula. Study of local and global extrema of functions of several variables, necessary and sufficient conditions for local extrema. Implicit function and its study. Conditional extrema. Elements of differential calculus of maps. Diffeomorphisms.</p> <p><i>Classes:</i> Space R^n and its topology. Functions of several variables, limits, continuity. Differential calculus in several variables, directional and partial derivatives of the first order, differentiability. Partial derivatives of higher order, Taylor formula. Study of local and global extrema of functions of several variables, necessary and sufficient conditions for local extrema. Implicit function and its study. Conditional extrema. Elements of differential calculus of maps. Diffeomorphisms.</p>

4.3. Intended learning outcomes

Code	A student, who passed the course	Relation to learning outcomes
within the scope of KNOWLEDGE:		
W01	Presents basic elements of differential calculus in several variable	MAT1A_W04 MAT1A_W07
W02	Analyse behaviour of functions on curves and surfaces	MAT1A_W04 MAT1A_W10
W03	Explains elements of differential calculus of maps	MAT1A_W04 MAT1A_W10
within the scope of ABILITIES:		
U01	Studies differentiability of functions and maps of several variables	MAT1A_U01 MAT1A_U03
U02	Finds local extrema of functions of two and three variables and uses Lagrange method to find conditional extrema	MAT1A_U01 MAT1A_U05

U03	Constructs diffeomorphisms between given domains	MAT1A_U01 MAT1A_U08
within the scope of SOCIAL COMPETENCE:		
K01	Formulates questions helpful to deep understanding a subject	MAT1A_K02

4.4. Methods of assessment of the intended learning outcomes

Teaching outcomes (code)	Method of assessment (+/-)																				
	Exam oral/written*			Test*			Project*			Effort in class*			Self-study*			Group work*			Others* e.g. standardized test used in e-learning		
	Form of classes			Form of classes			Form of classes			Form of classes			Form of classes			Form of classes					
	L	C	...	L	C	...	L	C	...	L	C	...	L	C	...	L	C	...	L	C	...
W01	+				+																
W02	+				+																
W03	+				+																
U01	+				+									+							
U02	+				+									+							
U03	+				+									+							
K01											+										

*niepotrzebne usunąć

4.5. Criteria of assessment of the intended learning outcomes

Form of classes	Grade	Criterion of assessment
lectures (L)	3	at least 50% and no more than 60% of the total number of points possible
	3,5	more than 60% and no more than 70% of the total number of points possible
	4	more than 70% and no more than 80% of the total number of points possible
	4,5	more than 80% and no more than 90% of the total number of points possible
	5	more than 90% of the total number of points possible
classes (C)*	3	at least 50% and no more than 60% of the total number of points possible
	3,5	more than 60% and no more than 70% of the total number of points possible
	4	more than 70% and no more than 80% of the total number of points possible
	4,5	more than 80% and no more than 90% of the total number of points possible
	5	more than 90% of the total number of points possible

5. BALANCE OF ECTS CREDITS – STUDENT'S WORK INPUT

Category	Student's workload	
	Full-time studies	Extramural studies
<i>NUMBER OF HOURS WITH THE DIRECT PARTICIPATION OF THE TEACHER /CONTACT HOURS/</i>	126	
<i>Participation in lectures*</i>	60	
<i>Participation in classes, seminars, laboratories*</i>	60	
<i>Preparation in the exam/final test*</i>	2/4	
<i>INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/</i>	74	
<i>Preparation for the lecture*</i>	28	
<i>Preparation for the classes, seminars, laboratories*</i>	30	
<i>Preparation for the exam/test*</i>	8/8	
TOTAL NUMBER OF HOURS	200	
ECTS credits for the course of study	8	

* delete as appropriate

Accepted for execution (date and legible signatures of the teachers running the course in the given academic year)