Faculty of Science and Mathematics / PHYSICS / MATHEMATICS I

Course:	MATHEMATICS I			
Course ID	**Course status**	**Semester**	**ECTS credits**	**Lessons** (Lessons+Exercises+Laboratory)
1310	Mandatory	1	8	3+3+0
Programs	PHYSICS			
Prerequisites				
Aims	The aim of the course is mastering the basics of mathematical analysis: the notion of convergence, practical methods for calculation of limit values, elements of differential calculus and its applications in the graphics drawing functions.			
Learning outcomes	After passing this exam, the student should be able to 1. Defines the notion of convergent sequence and successfully use various techniques for finding the limit values and prove the convergence of a sequence. 2. Find limit values of functions and determines intervals of their continuity. 3. Make a graph of basic and complex functions. 4. Determines derivatives of basic and complex functions. 5. Use derivatives and The Mean Value Theorem to solve some practical problems in physics, as well as the maximum and minimum problems.			
Lecturer / Teaching assistant	Vladimir Božović and Dušica Slović			
Methodology	Lectures, exercises, independent work, and consultations.			
Plan and program of work				
Preparing week	Preparation and registration of the semester			
I week lectures	Review - notion of a sequence, Arithmetic and Geometric sequence.			
I week exercises	Review - notion of a sequence, Arithmetic and Geometric sequence.			
II week lectures	The notion of convergence, Convergent sequences - definition and examples			
II week exercises	The notion of convergence, Convergent sequences - definition and examples			
III week lectures	Properties of convergent sequences, Monotone sequences, Number e as a limit of the seqeunce			
III week exercises	Properties of convergent sequences, Monotone sequences, Number e as a limit of the seqeunce			
IV week lectures	Some interesting application of sequences - Examples in Physics			
IV week exercises	Some interesting application of sequences - Examples in Physics			
V week lectures	The nootion of series - series as a sequence, Properties of series			
V week exercises	The nootion of series - series as a sequence, Properties of series			
VI week lectures	The limit of a function, Calculating limits using the limit laws			
VI week exercises	The limit of a function, Calculating limits using the limit laws			
VII week lectures	The precise definition of a limit, Continuity			
VII week exercises	The precise definition of a limit, Continuity			
VIII week lectures	Midterm exam			
VIII week exercises	Midterm exam			
IX week lectures	Derivatives, The derivative as a function, Derivatives of elementary functions			
IX week exercises	Derivatives, The derivative as a function, Derivatives of elementary functions			
X week lectures	The Chain Rule, Derivatives of functions in implicit and parametric form			
X week exercises	The Chain Rule, Derivatives of functions in implicit and parametric form			
XI week lectures	Applications of differentiation, Maximum and minimum values, The Mean Value Theorem			
XI week exercises	Applications of differentiation, Maximum and minimum values, The Mean Value Theorem			
XII week lectures	How derivatives affect the shape of a graph, Indeterminate forms and L’Hospital’s rule, Review			
XII week exercises	How derivatives affect the shape of a graph, Indeterminate forms and L’Hospital’s rule, Review			
XIII week lectures	Taylor and Maclaurin Series			
XIII week exercises	Taylor and Maclaurin Series			

XIV week lectures	Monotonicity, convexity and inflection points of differentiable functions, Graphing functions
XIV week exercises	Monotonicity, convexity and inflection points of differentiable functions, Graphing functions
XV week lectures	Makeup exam
XV week exercises	Makeup exam
Student workload	

Per week	**Per semester**
8 credits x 40/30=10 hours and 40 minuts 3 sat(a) theoretical classes 0 sat(a) practical classes 3 excercises **4 hour(s) i 40 minuts** of independent work, including consultations	Classes and final exam: **10 hour(s) i 40 minuts x 16 =170 hour(s) i 40 minuts** Necessary preparation before the beginning of the semester (administration, registration, certification): **10 hour(s) i 40 minuts x 2 =21 hour(s) i 20 minuts** Total workload for the subject: **8 x 30=240 hour(s)** Additional work for exam preparation in the preparing exam period, including taking the remedial exam from 0 to 30 hours (remaining time from the first two items to the total load for the item) **48 hour(s) i 0 minuts** Workload structure: **170 hour(s) i 40 minuts (cources), 21 hour(s) i 20 minuts (preparation), 48 hour(s) i 0 minuts (additional work)**
Student obligations	Students are encouraged to attend classes regularly, although this is not mandatory. However, it is doubtful that one will do well in the course if you miss too many lectures.
Consultations	As agreed with the professor or teaching assistant.
Literature	1. Z. Kaldeburg, V. Mićić, S. Ognjanović, Analiza sa algebrom III, ”Krug” Beograd, 2000. 2. James Stewart, Early Transcendentals 6, ISBN-13: 978-0-495-01166-8, 2008.
Examination methods	The forms of testing and grading 1. Midterm exam (up to 45 points) and Final exam (up to 45 points). 2. The points awarded for special commitment (up to 10 points). Grading scale: F (below 50 points), E (50-59 points), D (60-69), C (70-79), B (80-8
Special remarks	
Comment	If opportunity to take a makeup test, or correctional final exam is used, then the results achieved on them will be treated as definitive.

Grade:	F	E	D	C	B	A
Number of points	less than 50 points	greater than or equal to 50 points and less than 60 points	greater than or equal to 60 points and less than 70 points	greater than or equal to 70 points and less than 80 points	greater than or equal to 80 points and less than 90 points	greater than or equal to 90 points