Program	Level	First cycle		
	Name of the program	Pure Mathematics, Applied Mathematics, Mathematics Education, Mathematics and Informatics Education		
COURSE				
Course title	**Analysis III**			
Course code	Semester	Course status	ECTS	Contact hours (L+AE+LE)
PMAT 230	III	Mandatory course	7	4+3+0
Lecturer				
Course Goals	The main objects considered in Analysis III are functions of several variables. It consists of two main parts, differential and integral calculus of functions of several variables. The main aim of the course is to, combined with courses Analysis I and Analysis II, form a good basis for studying more advanced fields of mathematical analysis.			
Learning Outcomes	After completing this course, students should demonstrate competency in the following skills: - Understand terms introduced in the fields of differential and integral calculus of functions of several variables; - Be able to discuss the existence and calculate limits of functions of several variables; - Be able to use different techniques of differential calculus of several variables; - Be able to use different methods to calculate n-dimensional integrals; - Be able to calculate line and surface integrals; - Be able to apply the Theorems of Gauss, Green, and Stokes.			

COURSE CONTENT

- Fourier series. Function approximation using trigonometric polynomials. Basics of summability theory.
- $\mathbb{R}^n$ space. Functions of several variables, limits, and continuity.
- Partial derivatives, differentials, derivative, chain rule, directional derivative.
- Higher order derivatives and differentials, chain rule.
- Taylor formula.
- Theorems on implicate and inverse functions.
- Extremum problems.
- Multiple integrals over intervals, integrability.
- Multiple integrals over admissible sets, properties, and changes of variables.
- Fubini theorem.
- Improper integrals.
- Lines in $\mathbb{R}^n$, line integrals.
- Surfaces in $\mathbb{R}^n$, surface integrals.
- Theorems of Gauss, Green, and Stokes.

LITERATURE

[1] F. Vajzović i M. Malenica, Diferencijalni račun funkcija više promjenljivih, Univerzitetska knjiga, Sarajevo, 2002.
[2] F. Vajzović i M. Malenica, Integralni račun funkcija više promjenljivih, Univerzitetska knjiga, Sarajevo, 2002.
[3] I. I. Ljaško, A. K. Boljarčuk, et al: Zbirka zadataka iz matematičke analize, prevedeno izdanje, Naša knjiga d.o.o. Beograd, 2007.
[4] P.M. Miličić i M.P. Uščumlicl Zbirka zadataka iz više matematika II
[5] V. A. Zorich: Mathematical Analysis II, Springer, 2003.
[6] S. Kurepa: Matematička analiza III diol Funkcije više varijabli, Tehnička knjiga, Zagreb 1970.
[7] D. Mihailović, D.Đ. Tošicl Elementi matematičke analize II, Naučna knjiga, Beograd, 1991.
[8] 4. J. Bektešević, V. Hadžiabdić, M. Mehuljić i E. Pilav: Teorijske osnove i zbirka riješenih zadataka iz višestrukih, krivolinijskih i površinskih integrala, Prirodno-matematički fakultet, Sarajevo, 2018.

STUDENT WORKLOAD (hours in a semester)							
Lectures	60	Exercises	45	Individual work	70	T o t a l	175

GRADING			REMARKS
Criterion	Maximum points	Minimum points	
Midterm exams			
Final exam			
T o t a l	100	55	