Study programme(s): Applied Mathematics (MAP)

Course title: DIFFERENTIAL AND INTEGRAL CALCULUS (P201)

Lecturer(s): Ivana Vojnović

Course status: compulsory

ECTS points: 7

Requirements:

Learning Objectives

Introduction to the basic notions of differential and integral calculus for functions of one single real variable.

Learning Outcomes

The student is expected to master the basic concepts of differential and integral calculus for real functions of one real variable as well as their applications to solve various problems.

Syllabus

Theoretical instructions

Differential calculus, definition and fundamental theorems, L'Hospital's rule, Taylor's formula. Monotonicity and local extrema of functions, convex and concave functions. Applications of differential calculus in practice.

Integral calculus of real functions of a single real variable, indefinite integral and the Riemann integral, properties, Newton-Leibnitz formula. Calculating surfaces and volumes using integrals, as well as other applications of integral calculus in practice. Improper integrals, convergence of the improper integral. Sequences and series of functions, power series.

Practical instructions

Tasks and problems in practical teaching follow the content of the theoretical instructions. Theoretical results will be illustrated through well-chosen examples, exercises and applications, that are practicably guiding students to adopt the required techniques.

Literature

1. Ljiljana Gajić, **Predavanja iz Analize 1**, PMF, 2006.
2. Ljiljana Gajić, Stevan Pilipovic, Nenad Teofanov, **Zbirka zadataka iz analize 1 - drugi deo.** PMF, 2009.
3. James Stewart, **Calculus**, 8thth ed., Cengage Learning,2016.

Number of active classes	**Lectures: 3**	**Exercises: 3**

Teaching methods

Lectures: Classical methods of exposition of theoretical basics with examples and applications.

Exercises: Adopting the theory through examples and problems solving sessions.

Grading (maximum number of points 100)

Pre-exam obligations	Points	**Final exam**	Points
colloquia	**50**	oral exam	**50**