**Study programme(s): Applied mathematics (MAP)**

**Course title: MULTIDIMENSIONAL ANALYSIS (P301)**

**Lecturer(s): Sanja Konjik**

**Course status: compulsory**

**ECTS points: 6**

**Requirements:** Introduction to Analysis

**Learning Objectives**

Acquiring knowledge and skills in the field of differential calculus of functions of several real variables and the fundaments of integral calculus of functions of several real variables.

**Learning Outcomes**

Student qualified for the application of acquired knowledge and skills to specific problems in the field of multidimensional differential calculus and its applications.

**Syllabus**

*Theoretical instructions*

Functions of two and three real variables: convergence, continuity, parametric equations and curves. Differential calculus for functions of multiple variables: partial derivatives, differentiability, differential, directional derivative, conditional extrema. Operators of differential calculus: gradient, divergence, rotor, Hessian, Laplacian, etc. Implicit functions and inverse mappings. Applications of differential calculus.

Short introduction to the integral calculus of functions of several variables: double and triple integral, change of variables, Fubini's theorem.

*Practical instructions*

Tasks and problems in practical exercises follow the content of theoretical instructions. Application of knowledge gained in theory classes in solving specific problems and tasks.

**Literature**


1. Mirjana Štrboja, **Funkcije više promenljivih sa vizualizacijom**, PMF Novi Sad, 2016.
2. Jelena Aleksić, **Predavanja iz Analize 2**, PMF Novi Sad, ISBN 978-86-7031-369-9.
3. D. Perišić, S. Pilipović, M. Stojanović, **Funkcije više promenljivih - diferencijalni i integralni račun**, PMF, 1997.
4. Stewart, J., **Multivariable Calculus**, 7th edition, Books/Cole, Belmont, 2012.
5. Stewart, J., **Calculus**, 8th edition, Cengage Learning, Boston, 2016.
6. S. Radenović, **Matematička analiza 2 - metodska zbirka zadataka**, Beograd, 2002.


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

**Teaching methods**

Expository lectures given by teachers, conversation and discussion with students, practical work, problem solving sessions and concrete applications.

**Grading (maximum number of points 100)**

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