Study programme(s): Applied mathematics (MB), Mathematics (MA), Master in Mathematics Teaching (MP)

Level: master

Course title: Selected topics in applied algebra (MB-12)

Lecturer: Andreja P. Tepavčević

Status: elective for MA, MB and MP

ECTS: 5

Requirements: none

Learning objectives

Acquiring knowledge of the various techniques of applied algebra and training in solving practical problems using these techniques.

Learning outcomes

Knowledge of various techniques of applied algebra and ability of solving certain types of practical problems. A successful student would be able to independently choose the applied algebra techniques that are best suited to solve certain problems.

Syllabus

Theoretical instruction

After the systematization of the classical algebra used in applications, basis of one or more of the following areas will be presented: theory and application of fuzzy sets, coding theory, cryptography and cryptanalysis, theory of clones, formal concept analysis, mathematical genetics, pattern recognition with applications in biology.

Practical instruction

Suitable problems will be solved by methods in applied algebra, preferably using the Matlab or a similar program.

Literature:

1. R. Lidl, G. Pilz, Applied Abstract Algebra, 2-nd ed., Springer, 1998.
2. A. Tepavčević, Z. Lužanin, Mathematical methods in taxonomy, University of Novi Sad, Faculty of Science, 2006.
3. G. Klir, B. Yuan, Fuzzy Sets and fuzzy logic, Theory and Applications, Prentice Hall 2002.
4. B. Ganter, R. Wille, Formal Concept Analysis, Springer 1999.
5. A. Edwards, Foundations of Mathematical Genetics, Cambridge University Press 2000.
6. D. Acketa, Selected Topics in the theory of pattern recognition with applications, University of Novi Sad 1986.
7. D. Stinson, Cryptography: theory and practice, CRC Press Inc. 2002.

Weekly teaching load				Other: 0
Lectures: 3	Exercises: 1	Other forms of teaching: 0	Student research: 0	

Teaching methodology

Lectures are presented using classical teaching methods and supported by a beamer. During practical instructions, typical examples of problems will be solved independently and in teams. Each student will complete two projects and write and defend a seminar paper.

Grading (maximum number of points 100)

Pre-exam obligations	**points**	**Final exam**	**points**
Projects	40	Defence of seminar paper	60