Study programme(s): Computer Science	

Level: master

Course title: Combinatorial structures in Computer Science

Lecturer: Dragan Mašulović, Maja Pech

Status: elective

ECTS: 6

Requirements: ---

Learning objectives
In this course students shall acquire advanced knowledge in combinatorics and will understand different combinatorial structures and methods, together with their theoretical background.

Learning outcomes
At the end of the course a successful student will be able to formulate and solve a variety of advanced combinatorial problems, to apply different combinatorial methods to examples and to explain applications.

Syllabus
The course covers some of the following topics:
- Number series in Combinatorics (such as e.g. Stirling, Fibonacci, Catalan, etc.)
- Systems of distinct representatives
- Latin squares
- Codes and designs
- Generating functions
- Permutations
- etc.

Each topic will include basic definitions and results, fundamental techniques and advanced results and applications.

Literature
P. J. Cameron: "Combinatorics: Topics, Techniques, Algorithms", 2nd Ed, Cambridge University Press 1996
J. H.van Lint, R. M. Wilson: „A Course in Combinatorics", 2nd Ed, Cambridge University Press 2001

Weekly teaching load				Other: **0**
Lectures: 2	Exercises: 2	Practical Exercises: 0	Student research: 0	

Teaching methodology
Lectures are presented using classical teaching methods supported by beamer presentations and continuous interaction with students. The ability of application of theoretical knowledge is checked through independent solving of exercises on two colloquia. The final exam is oral and a student is supposed to demonstrate general understanding of the presented theoretical material.

Grading method (maximal number of points 100)

Pre-exam oblications	points	Final exam	points
Colloquium 1	**30**	*Oral exam*	*40*

| Colloquium 2 | **30** | | |