Study program: Mathematics (Ph.D. program)	
Course: Operations Research	
Course instructor(s): Nataša Krejić	
Course type (compulsory/elective): elective	
Credit points: 10 ECTS	
Prerequisites: -	

Course objectives:
Introduction to the theory and methods of operations research.

Learning outcomes:
The student will understand the complex tools of operations research and will be able to apply it to real-life problems.

Course description (outline):
Modeling, constraints, target functions, multicriteria functions. The methodology of operations research: mathematical programming, simulation, heuristic programming. Muticriteria problems, methods for determination of the Pareto optimum. Stochastic models and its applications in economics and technology. Decisions and states. The problem of linear resources and two states. Stochastic programs with many states. The problem of non-linear stochastic programming. The problem of integer stochastic programming. Approximations and sampling methods. The Monte Carlo method. Gradient estimations. Min-max stochastic problems.

References:
1. Winston, W. L. Operations Research: Applications and Algorithms 2003, Duxbury Press
2. Eiselt, H.A., Integer Programming and Network Models, Springer 2000
3. Marti, K. Stohastic Optimization Methods, Springer, 2006.
4. Birge, J.R., Louveaux, F., Introduction to Stochatic Programming, Springer, 1997.
5. J.C.Spall, Introduction to Stochastic Search and Optimization,Wiley-Interscience, 2003

Active teaching hours	**Theoretical classes:** 2	**Practice classes:** -6

Methods of teaching:
Lectures and practice, with active participation of the students, discussion, seminars, etc.

Grading structure			
Pre-exam obligations	**Points**	**Exam**	**Points**
Colloquia	**25**	Oral exam	**25**
Seminars			