

Specification for the book of courses

Study program		Computing and Informatics		
Module		Data Science		
Type and level of studies		Master studies		
The name of the course		Methods of optimization		
Lecturer (for lectures)		Marinković D. Slađana		
Lecturer/associate (for exercises)		Jovančić S. Vladan		
Lecturer/associate (for OFE)				
Number of ECTS		4	Course status (obligatory/elective)	Elective
Prerequisites				
Course objectives		Gaining basic mathematical knowledge of multivariable functions and optimization theory including different optimization methods. Developing skills of mathematical modelling of real problems of practice, as well as solving them.		
Course outcomes		Students' competence to put the gained knowledge into practice. Competence to identify and define the optimization problems of practice, develop mathematical models, choose the appropriate methods for their solving and the application of methods.		
Course outline				
Theoretical teaching		Real multivariable functions. Partial derivatives, gradient, hessian. Local, constrained and global extrema. Taylor formula. Elements of convex analysis. General optimization problem. Linear programming. Duality. Simplex method. Nonlinear programming. Searching and gradient methods. Constrained optimization: optimality conditions. Penalty functions method.		
Practical teaching (exercises, OFE, study and research)		Exercises of knowledge gained in the lectures. Impementation of optimization algorithms by the appropriate software.		
Textbooks/references				
1	Lj. M. Kocić, G. V. Milovanović, S. D. Marinković, Operational research, University of Niš, Faculty of electronic engineering, Niš, 2007.(in Serbian.)			
2	Lj.M. Kocić, Functions of several variables, University of Niš, Faculty of Electronic Engineering, Niš, 2008. (Serbian).			
3	G.V. Milovanović, P.S. Stanimirović, Symbolic Implementation of Nonlinear Optimization, University of Niš, Faculty of Electronic Engineering, Niš, 2002 (Serbian).			
4	G.B. Dantzig, M.N.Thapa,Linear Programming: Introduction, Springer, 1997.			
5				
Number of classes of active education per week during semester/trimester/year				
Lectures	Exercises	OFE	Study and research work	Other classes
2	1	0		
Teaching methods		Lecture, exercises, consultations.		
Grade (maximum number of points 100)				
Pre-exam duties		Points	Final exam	Points
Activity during lectures			Written exam	40
Exercises			Oral exam	20
Colloquia				
Projects		40		