

Program		Type of studies (cycle)	Third cycle		
		Name of the program	SEE Doctoral Studies in Mathematical Science		
Course					
Course title		Constraint and Unconstraint Optimization			
Course code	Semester	Course status	ECTS credits	Contact hours	
	I		10	30	
Teaching staff	Teacher	Prof. Dr. Željko Jurić			
	Other staff	Prof. Dr. Gregory John von Winckel			
Course goals	The course should provide an overview on a wide range of methods for various optimization problems, such as unconstrained and constrained optimization problems. The students should learn about the essential theoretical results and equally important, about numerical algorithms for solving optimization problems. The course will also include some topics which are represented as research topics in this filed.				
Course content/topics					
<ul style="list-style-type: none"> • Unconstrained optimization <ul style="list-style-type: none"> ○ Fundamentals ○ Line search methods ○ Trust-region methods ○ Conjugate gradient methods ○ Quasi-Newton methods ○ BFGS-methods ○ Calculus of variations and optimal contro • Constraint optimization <ul style="list-style-type: none"> ○ Optimality conditions ○ Linear programming, interior point methods ○ Quadratic programming ○ SQP methods ○ PDE-constraint optimization 					
LITERATURE		Grading			
[1] J. E. Dennis and R. B. Schnabel, Numerical Methods for Unconstrained Optimization, SIAM, Philadelphia 1996. [2] C. T. Kelley, Iterative Methods for Optimization, Frontiers in Applied Mathematics Vol. 18, SIAM, Philadelphia 1999. [3] D. G. Luenberger, Linear and Nonlinear Programming, Addison-Wesley, Reading (USA) 1984. [4] K. Mietinen, Nonlinear Multiobjective Optimization, Kluwer, Dordrecht 1999. [5] J. Nocedal and S. Wright, Numerical Optimization, 2nd ed., Springer-Verlag, NewYork 2006. [6] R. E. Steuer, Multiple Criteria Optimization: Theory, Computations and Applications, John Wiley & Sons, New York 1986. [7] B. Rustem, Algorithms for Nonlinear Programming and Multiobjective Design, John Wiley & Sons, Chichester 1998.			Criterion	Points	Cut-off points
		1.	Written assignment	20	11
		2.	Project	40	22
		3	Final exam	40	22
		Total			100