

Incoming student mobility

UNIOS University Unit: DEPARTMENT OF MATHEMATICS

COURSES OFFERED IN FOREIGN LANGUAGE
FOR ERASMUS+ INDIVIDUAL INCOMING STUDENTS

Department or Chair within the UNIOS Unit	Department of Mathematics
Study program	Graduate university study programme in mathematics (Master level) Branches: <ul style="list-style-type: none"> • Financial Mathematics and Statistics-elective • Mathematics and Computer Science-obligatory
Study level	Graduate (master)
Course title	Nonlinear optimization
Course code (if any)	M129
Language of instruction	English
Brief course description	<p>Syllabus.</p> <ol style="list-style-type: none"> 1. Introduction and motivation. Illustrative examples. 2. Convex and quasi-convex functions. Lipschitz-continuous functions. Local and global minimum. 3. One-dimensional minimization of differentiable functions. The method of tangents. Newton's method. 4. One-dimensional minimization of non-differentiable functions. Half method. Gold cut method. Piavsky method, Shubert method, DIRECT method. 5. Multidimensional minimization of differentiable functions. The gradient method. Newton's method. Quasi-Newton methods. Conjugate Direction Method. 6. Multidimensional minimization of non-differentiable functions. The Nelder-Mead method. DIRECT method, Branching and fencing method. Population algorithms. 7. Nonlinear least squares problem. Gauss-Newton method. The Marquardt method. 8. Nonlinear problems of the smallest absolute deviations.

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EU programme for education, training, youth and sport

	Application of DIRECT algorithm.
Form of teaching	Consultative teaching.
Form of assessment	Lectures and exercises are obligatory. The exam consists of a written and an oral part. Upon completion of the course, students can take the exam. Successful midterm exam scores replace the written exam.
Number of ECTS	7
Class hours per week	3+2+0
Minimum number of students	
Period of realization	Summer semester
Lecturer	Kristian Sabo