

Course content for International Master program „Mathematical modeling, computation and optimization“

Course name	Nonlinear Optimization
Contents and Objectives	<p><u>Content:</u></p> <ul style="list-style-type: none"> • unconstrained optimization: optimality conditions, convergence concepts, basic numerical optimization methods, e.g. Newton's method, line-search, trust-region etc. • constrained optimization: optimality conditions, basic numerical optimization methods, e.g. penalty and barrier methods , SQP methods, etc. <p><u>Objectives of the course:</u> Within the realm of smooth nonlinear optimization it should enable to choose, adapt or develop suitable methods for suitably formulated optimization problems and to analyze them competently with respect to convergence, computational efficiency and solution properties.</p>
Teaching	<p>This course consists of lectures and exercise classes.</p> <ul style="list-style-type: none"> • Lecture: Nonlinear Optimization (3h/week) • Exercise class: Nonlinear Optimization (1h/week)
Prerequisites	Basic notions of Analysis and Linear Algebra, preferably also some basic knowledge in optimization
Examination	Oral exam (30 minutes)
Credits	6 ECTS points
Frequency	This course is given at least every second year.
Workload	The estimated total working time for this course is 180 hours.
Duration	This course is given during one semester.