Course description for International Master's program „Mathematical Modeling, Computation and Optimization"

Course Name	Optimization with Partial Differential Equations
Contents and Objectives	Contents: • optimal control problems for elliptic partial differential equations (PDEs) • parameter identification in elliptic PDE models • shape optimization with elliptic PDEs Objectives: In this class you will • get to know some basic examples of optimization problems, • learn about necessary and sufficient optimality conditions (as a starting point for numerical solution schemes), • learn to use numerical methods for the solution of optimal control problems
Teaching	This course consists of lectures and exercise classes. • Lecture: Optimization with PDEs (4h/week) • Exercise: Optimization with PDEs (2h/week)
Prerequisites	Knowledge of optimization, functional analysis, or numerical methods for PDEs will be helpful.
Examination	Oral exam (30 minutes)
Credits	8 ECTS points
Frequency	This course is given at least every other year.
Workload	The estimated total working time for this course is 270 hours.
Duration	This course is given during one semester.