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

Course Name	Numerical Methods for Partial Differential Equations (PDEs)
Contents and Objectives	Contents: • initial and boundary value problems for PDEs • finite difference or finite volume methods • finite element method • approximation, stability, convergence • error estimation • algorithmic realization Objectives: In this class you will get to know the most important discretization methods for various classes of partial differential equations as well as basic tools for their numerical analysis and algorithmic implementation. Through the lab, you will acquire hands-on experience in solving partial differential equations.
Teaching	This course consists of lectures and exercise sessions. • Lectures: Numerical Methods for PDEs (4h/week) • Exercises: Numerical Methods for PDEs (2h/week)
Prerequisites	Basic knowledge in numerical analysis is required. Knowledge of functional analysis or analysis of PDEs will be helpful.
Exams	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.