

# Lecture with Computer Exercises: Modelling and Simulating Social Systems with MATLAB

Spring Term 2011

Monday 17:15 – 18:45, HG E 27  
3 ECTS

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## Description

This course introduces first the basic functionalities and features of the mathematical software package MATLAB, such as the simple operations with matrices and vectors, differential equations, statistical tools, the graphical representation of data in various forms, and video animations of spatio-temporal data. With this knowledge, students are expected to implement themselves in MATLAB, models of various social processes and systems, including agent-based models, e.g. models of interactive decision making, group dynamics, human crowds, or game-theoretical models. Part of this course will consist of supervised programming exercises in a computer pool. Credit points are finally earned for the implementation of a mathematical model from the sociological literature in MATLAB and the documentation in a seminar thesis.

## Requirements and Grading

Students have to earn their credit points by implementing an established mathematical model from the social science literature in MATLAB. During the course students are required to submit a short proposal specifying their intended project. At the end of the course, projects must be documented in a 30-page seminar thesis and presented in a 15-minute seminar talk. The thesis should include a discussion of the mathematical model, the theoretical concept behind it, the meaning of formulas, properties of the model, and parameter dependencies, but also possible practical implications. The computer code should be sufficiently well documented.

All course materials will be made available through the course website.