ADVANCED MACROECONOMIC SIMULATION (075 515)
COURSE OUTLINE SUMMER SEMESTER 2025
Prof. Michael Roos / Michelle Alfers

This course announcement refers to the module in the **MSc programs** Management & Economics and Economic Policy Consulting.

CONTENT

Macroeconomic outcomes result from the interaction of millions of heterogeneous individual and firms. At the same time, the individual behavior at the microeconomic level is influenced and constrained by emergent structures at the macro level such as habits or social norms.

Modeling these interactions between many heterogeneous agents and the interaction between different levels of the economy is very challenging with mathematical equilibrium models. The new field of emergent macroeconomics uses agent-based modeling as a modern computer simulation approach to macroeconomics.

The lecture provides background information on this approach, presents current research and introduces students to economic modeling with agents. In the lab sessions, students learn how to program in an agent-based modeling software and how to analyze the implemented models. In the seminar, students will present their ideas for their own model, show the progress of their work, and receive feedback from their peers and the instructors. They will also present their final results in the seminar.

Students will work in groups of three to develop, implement and analyze their models. Because simulation work is usually done in teams of specialists. Teamwork is a key social skill that will be developed in this module.

MODULE OBJECTIVES

After taking this class, you can

- design an own small macroeconomic model;
- implement the model as an agent-based model in a team;
- simulate the model with specialized computer software;
- analyze the model;
- evaluate the model, its insights and limitations;
- communicate the model and its result in written form.

A key learning objective is that students acquire the technical skills to understand and work with agent-based models. These technical skills are important for the application of the models and for own research.

PREREQUISITES

You will need good English skills and the willingness to learn writing computer code. Participation requires the successful completion of "Macroeconomics".

ORGANIZATION

This module consists of lectures, lab sessions and seminars.

Participants:	15
Registration:	Pre-registration in Moodle course by 9 April 2025. FlexNow registration (needed for credit) 26.5. – 20.6.2025.
Assessment:	Participants have to write a **project paper** and give a **presentation** on the paper. Further details on the paper will be provided on Moodle during the course of the module. You have to take a test on programming skills and give two seminar presentations (Studienleistungen) to be allowed to write the project paper. More information will be provided on Moodle.
Time and place:	Friday, 10.15-11.45 h, GD 02/236 (Lecture) Tuesday, 14.15 – 15.45 h, GD 03/230 (Tutorial) Tuesday, 16.00 – 17.30 h, GD 03/230 (Seminar)
Start:	11 April 2025

SCHEDULE

The following schedule is preliminary and subject to change.

Lectures

Week	Date	Topic
1	11 April	Introduction
2	No lecture	
3	25 April	Simple example model
4	2 May	Lengnick model
5	No lecture	
6	16 May	Macroeconomy and macro models
7	23 May	Consumption and saving I
8	30 May	Consumption and saving II
9	6 June	Production and employment
10	No lecture	
11	20 June	Prices and wages
12	No lecture	
13	4 July	Investment
14	11 July	Government and central bank
15	18 July	Complete model

Lab sessions

Week	Date	Topic
1	No meeting	

2	15 April	Using NetLogo
3	22 April	Example model
4	29 April	Basics
5	6 May	Basics
5	9 May	Basics
6	13 May	Basics
7	20 May	Basics
8	27 May	Consumption
9	3 June	Consumption
10	No meeting	
11	17 June	Production
12	24 June	Prices
13	1 July	Investment
14	8 July	Market
15	15 July	Complete model

Seminars

Week	Date	Topic
1	No meeting	
2	No meeting	
3	No meeting	
4	No meeting	
5	6 May	Presentation of research paper from the literature
6	13 May	Presentation of research paper from the literature
7	20 May	Presentation of research paper from the literature
8	No meeting	
9	No meeting	
10	No meeting	
11	17 June	Presentation of own research idea
12	No meeting	
13	No meeting	
14	8 July	Presentation of own project paper
15	15 July	Presentation of own project paper

SELF-STUDY

This module contains 120 hours of self-study.

You are expected to prepare the lecture by reading the relevant literature provided in the Moodle course. Furthermore, you have to do programming exercises.

MOODLE COURSE

The Moodle course for this module is

Macroeconomic Simulation (073 601 / 075 515-SoSe2025)

Please register early for the course. There is no password.

READING

Literature and information will be provided on Moodle.