

MACROECONOMIC SIMULATION (073 601)

COURSE OUTLINE SUMMER SEMESTER 2025

Prof. Michael Roos / Michelle Alferts

This course announcement refers to the module in the **BSc program** Management & Economics.

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, they receive an overview over research topics and how to structure a research project.

MODULE OBJECTIVES

After taking this class, you can

- explain the method of agent-based modeling with its strengths and weaknesses;
- critique existing models;
- explain why agent-based modeling is an appropriate method for macroeconomics;
- use the software NetLogo;
- simulate existing agent-based models and interpret the results;
- perform basic programming tasks

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 English skills and the willingness to learn writing computer code. Knowledge of macroeconomic models level is expected (successful completion of “Grundlagen der Makroökonomik”).

ORGANIZATION

This module consists of lectures, lab sessions and seminars.

Participants: 25

- Registration:** Pre-registration in Moodle course by 9 April 2025.
FlexNow registration (needed for credit) 26.5. – 20.6.2025.
- Assessment:** There will be a **final exam**. Further details on the exam will be provided on Moodle during the course of the module.
 You have to pass two **homework assignments** (Studienleistungen) to be admitted to the exam. 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	No meeting	
12	No meeting	
13	No meeting	
14	8 July	Presentation of project papers by MSc students
15	15 July	Presentation of project papers by MSc students

Please note that BSc students do not have to present in the seminars. However, the topics presented by MSc students in the seminars are relevant for the BSc students' exam.

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.