RUHR UNIVERSITÄT BOCHUM

SEMINAR IN MACROECONOMIC RESEARCH I

COURSE OUTLINE SUMMER SEMESTER 2020 – Focus: Agent-Based Modeling and Pandemics

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CONTENT

The current situation with respect to the Corona pandemic urgently asks for models to gain a deeper understanding of disease transmission, its economic and social consequences, and strategies to combat/mitigate the pandemic, whose success are ex ante unknown. Since agent-based modeling is one of the most-commonly used research tools to model the pandemics, students of this seminar are asked to focus on this new modeling technique and its application to the spread of diseases.

After an introduction to the basics of project management, you arrange yourself (or will be arranged) into working groups (2-3 students), in which a research project is processed using collaborative online tools. Here you apply the methodological knowledge of agent-based modeling (ABM) acquired in the previous seminars or lectures. You will learn the basics of data preparation and analysis in R and use this knowledge to evaluate your research results. In the final session, on 25th June, you will present and defend your research results. Afterwards you will write a seminar paper according to scientific standards (deadline: 31st August).

Please note, it is expected that students should have prior knowledge about agent-based modeling from "Agent-based modeling in economics and business" (073085-SoSe20). The course "Agent-based modeling in economics and business" will also be offered in the summer semester 2020. The course "Agent-based modeling in economics and business" develops an agent-based model of a spread of disease step by step, including lectures on the theory of Complexity Economics, Behavioral Economics and Agent-Based Modeling. Students that are willing to refresh their knowledge are also welcome.

ECTS: **5 ECTS**

Language: **The course will be conducted in English. Also your term paper will need to be written in English.**

OBJECTIVES

- Learn about agent-based models, what they are used for and in which aspects they differ from mainstream analytical models
- Learn about Complexity and Behavioral Economics, and why it matters for macroeconomics
- Learn how to design and implement an agent-based model using NetLogo
- Learn how to analyze agent-based models via R-Studio
- Learn how to work in teams

- Gain knowledge of project and time management

REQUIREMENTS

- Prior knowledge in “Agent-Based Modeling in Economics and Business”
- Very good English skills

ORGANIZATION

Participants: Maximum 15

Assessment: 100% term paper

Registration: You must register in FlexNow between 09th June and 03rd July

Deadline for handing in the term paper: 31st August 2020

Please register in the respective Moodle course before the first online meeting:

https://moodle.ruhr-uni-bochum.de/m/course/view.php?id=27409

READING LIST

Further literature (weekly readings) and information will be provided on Moodle (tba).

Gilbert, Nigel and Lynne Hamill (2015), ***Agent-Based Modelling in Economics***, Wiley.

Grimm, Volker and Steven F. Railsback (2011) ***Agent-Based and Individual-Based Modeling: A Practical Introduction***, Princeton University Press, 2011.

Wilensky, Uri and William Rand (2015) ***An Introduction to Agent-Based Modeling. Modeling Natural, Social, and Engineered Complex Systems with NetLogo***, MIT Press, 2015.

Time and Room: Tuesdays and Thursday 14.15 – 15.45 h

All meetings will take place online via Zoom.

The link to the Zoom meetings will be available in the Moodle course. By clicking on the respective link and following the instructions you can attend to the Zoom-Meetings.

For further information on how to join Zoom meetings, please visit: <https://support.zoom.us/hc/en-us/articles/201362193-Joining-a-Meeting>

Dates: First lecture: 09th June 2020

Zoom meeting

Date	Content
9th June	Introduction to the course
16th June	Basics of project management and joint work
18th June	Presentation of ideas on your model, team building and work on research project- Part 1
23th June	Presentation of ideas on your model, team building and work on research project- Part 2
25th June	Data structure and clearing (R-Studio) – Part 1
30th June	Data structure and clearing (R-Studio) – Part 2
1st July - 15th July	- Work on research project (self-guided) -
16th July	(Group) presentation of research results
21st July	Questions and Answer Sessions (non-mandatory)
23rd July	Questions and Answer Sessions (non-mandatory)
31st August	Deadline seminar paper