BEHAVIORAL AND COMPLEXITY MACROECONOMICS  
COURSE OUTLINE WINTER SEMESTER 2017-2018  
Dr. Paola D’Orazio

CONTENT

Agent-based computational economics (ACE) has been the subject of considerable interest as a tool for investigating macroeconomic issues. The economic modeling that relies on this approach emphasizes the micro to macro link because it allows the explicit representation and analysis of the interaction among individual agents as well as between agents and the economic environment.

The course will provide a broad introduction to the concepts of complexity, heterogeneity and interaction in economic models, and special attention is devoted to the study of macroeconomic agent-based models (ABM). A step-by-step introduction of essential ABM building blocks and a versatile, open access object-oriented programming platform will be presented in order to enable students to gain the basic knowledge to construct their own models and perform simulations.

OBJECTIVES

▪ Learn what agent-based models are, what they are used for and in what they are different from standard mathematical models  
▪ Learn what complexity and behavioral economics is, and why it matters for Macroeconomics  
▪ Learn how to design and implement an agent-based model using object-oriented programming

REQUIREMENTS

▪ Macroeconomics I is strongly recommended  
▪ Prior programming experience is helpful but not required  
▪ Very good English skills

ORGANIZATION

Participants: Maximum 25. Further details on the selection process will be provided during the first lecture.

Lecture: The module consists of lectures and tutorial sessions, both of which are relevant for the exam. In the tutorial sessions we will focus on the computational aspects of agent-based modeling.
Please note: Attending the lectures will help you understand the material and also help you gauge what is important for the test. This does not imply test questions will only come from lecture, only that in class I will cover the more challenging material from the relevant literature recommended for the course. You are responsible for the information in the recommended literature AND in the lectures.

Assessment:  
60% final written exam  
20% homework coding assignments  
20% group work  

Further details on the exam will be provided during the lecture and on Moodle in due course.

Time and Room:  
Wednesday, 12h-14h, GC 02/120

Begin:  
18.10.2017

SELF STUDY

This module contains 120 hours of self-study. You are expected to prepare the lecture by reading the relevant literature.

READING LIST

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


D’Orazio P., Giulioni G., From Micro Behaviors to Macro Dynamics: An Agent-Based Economic Model with Consumer Credit, Journal of Artificial Societies and Social Simulation, 2017


**SCHEDULE AND OUTLINE OF THE COURSE**

The following schedule is *preliminary* and subject to changes. Any change will be announced on Moodle in due course.

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<td>18 October</td>
<td>Lecture</td>
<td>- Overview of the course&lt;br&gt;- Rethinking Macroeconomics using Complexity Theory (I)</td>
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<tr>
<td>25 October</td>
<td>Tutorial</td>
<td>Introduction to Object-oriented programming (OOP)</td>
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<td>8 November</td>
<td>Lecture</td>
<td>Rethinking Macroeconomics using Complexity Theory (II)</td>
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<td>15 November</td>
<td>Tutorial</td>
<td>Building a model in Java - Repast Simphony: first steps</td>
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<td>Agent-based macroeconomics: a review (I)</td>
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<td>29 November</td>
<td>Tutorial</td>
<td>The “Behavioral Revolution”: agents and heterogeneity</td>
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<td>6 December</td>
<td>Lecture</td>
<td>Agent-based macroeconomics: a review (II)</td>
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<td>13 December</td>
<td>Tutorial</td>
<td>From theory to code (I)</td>
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<td>20 December</td>
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