

# Agent-Based Modelling

Single subject course

7.5 credits

Agentbaserad modellering

771A22

Valid from: 2019 Spring semester

**Determined by**

The Quality Board at the Faculty of Arts and  
Sciences

**Date determined**

2017-10-20

## Main field of study

Computational Social Science

## Course level

Second cycle

## Advancement level

A1F

## Entry requirements

- 180 ECTS credits passed including 90 ECTS credits in one of the following subject areas: social- and natural sciences, engineering, statistics, or maths
- 15 ECTS credits in statistics, computer science, mathematics, or equivalent at advanced level  
and
- English corresponding to the level of English in Swedish upper secondary education (English 6/B)  
(Exemption from Swedish)

## Intended learning outcomes

After completion of the course, the student should on an advanced level be able to:

- Describe key applications of agent-based simulation modeling (ABM) in the social sciences;
- Explain the logic behind and the explanatory role of agent-based modeling;
- Design and program different types of agent-based models;
- Run agent-based computational experiments;
- Evaluate the results of agent-based simulations through various forms of statistical sensitivity analyses.

## Course content

Agent-based modeling is a methodology for analyzing how groups of interacting individuals or other types of agents bring about various macro outcomes. This course

provides a detailed introduction to the agent-based modelling (ABM) technique. The course covers all the steps in the process of developing an ABM, from theoretical design to model implementation and model evaluation. During intensive computer labs, ABMs are implemented using object-oriented programming, including the treatment of variables, commands, and procedures. The course includes practical work with various types of computer-based experiments, as well as methods for evaluating the robustness of simulation results using various statistical sensitivity analyses.

## Teaching and working methods

The teaching consists of lectures, readings, computer labs and seminars. Homework and independent studies are a necessary complement to the course.

Language of instruction: English

## Examination

The course is examined through written assignments, active participation on seminars, computer labs and a final written individual assignment.

Detailed information about the examination can be found in the course's study guide.

If special circumstances prevail, and if it is possible with consideration of the nature of the compulsory component, the examiner may decide to replace the compulsory component with another equivalent component.

If the LiU coordinator for students with disabilities has granted a student the right to an adapted examination for a written examination in an examination hall, the student has the right to it.

If the coordinator has recommended for the student an adapted examination or alternative form of examination, the examiner may grant this if the examiner assesses that it is possible, based on consideration of the course objectives.

An examiner may also decide that an adapted examination or alternative form of examination if the examiner assessed that special circumstances prevail, and the examiner assesses that it is possible while maintaining the objectives of the course.

Students failing an exam covering either the entire course or part of the course twice are entitled to have a new examiner appointed for the reexamination.

Students who have passed an examination may not retake it in order to improve their grades.

## Grades

ECTS, EC

## Other information

If special circumstances prevail, the vice-chancellor may in a special decision specify the preconditions for temporary deviations from this course syllabus, and delegate the right to take such decisions.

Planning and implementation of a course must take its starting point in the wording of the syllabus. The course evaluation included in each course must therefore take up the question how well the course agrees with the syllabus.

The course is carried out in such a way that both men's and women's experience and knowledge is made visible and developed.

## Department

Institutionen för ekonomisk och industriell utveckling