Scientific Modelling: Normative and Practical Aspects

Vetenskapliga modeller: normativa och praktiska aspekter
7.5 credits

Programme course

721A62

Valid from: 2025 Spring semester

Determined by	**Main field of study**	
Course and Programme Syllabus Board at the Faculty of Arts and Sciences	Applied Ethics	
Date determined	**Course level**	**Progressive specialisation**
2023-10-10	Second cycle	A1N
Revised by	**Disciplinary domain**	
	Social sciences	
Revision date	**Subject group**	
	Philosophy	
Offered first time	**Offered for the last time**	
Spring semester 2025		
Department	**Replaced by**	
Institutionen för kultur och samhälle		

Course offered for

- Master's Programme in Ethics, Science, and Policy

Entry requirements

- Bachelor's degree equivalent to a Swedish Kandidatexamen
- English corresponding to the level of English in Swedish upper secondary education (Engelska 6)
  Exemption from Swedish

Intended learning outcomes

On completion of the course, the students should on an advanced level be able to:

- identify common philosophical questions regarding scientific modeling, including questions about scientific representation, the ontology of models, and the relationship between theories and models
- analyse the role of models in various scientific fields and distinguish between theoretical models and data models
- explain the differences between various forms of abstractions and idealizations in the practice of modeling
- describe the role of mathematics in different research contexts
- identify and describe how decisions made during the construction of models can have consequences for how these models are applied

Course content

The course covers the basics of the philosophy concerning scientific models and modeling, such as scientific representation and the nature and properties of models. The course discusses different views on the role of models in scientific research, as well as the role of mathematics in the creation of scientific models. Additionally, the basics of various methods for creating models are addressed. The practical consequences of the technical design of models are also studied.

Teaching and working methods

The course includes lectures, seminars, and writing assignments. Students are also expected to engage in self-study.

Language of instruction and examination: English.

Examination

The course is examined through:

- active participation in seminars, grading scale: UG
- individual written assignment, grading scale: EC

To get Pass (E) as the final grade, at least an E is required on the individual written assignment and a Pass on the other components. Higher grades are based on the individual written assignment.

Detailed information can be found in the 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

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 conducted in such a way that there are equal opportunities with regard to sex, transgender identity or expression, ethnicity, religion or other belief, disability, sexual orientation and age.

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.

About teaching and examination language

The teaching language is presented in the Overview tab for each course. The examination language relates to the teaching language as follows:

- If teaching language is “Swedish”, the course as a whole could be given in Swedish, or partly, or as a whole, in English. Examination language is Swedish, but parts of the examination can be in English.
- If teaching language is “English”, the course as a whole is taught in English. Examination language is English.
- If teaching language is “Swedish/English”, the course as a whole will be taught in English if students without prior knowledge of the Swedish language participate. Examination language is Swedish or English depending on teaching language.