



DEPARTMENT OF PHILOSOPHY, LINGUISTICS AND THEORY OF SCIENCE

LOG130 Modal logic, 7.5 credits

Modallogik, 7,5 högskolepoäng

Second Cycle

Confirmation

This course syllabus was confirmed by Department of Philosophy, Linguistics and Theory of Science on 2016-03-16 to be valid from 2016-08-29, autumn semester of 2016.

Field of education: Science 100%

Department: Department of Philosophy, Linguistics and Theory of Science

Position in the educational system

The course is included in the degree programme Logic, Master's programme, 120 credits (H2LOG), and can also be offered as a freestanding course or contract education.

The course can be part of the following programme: 1) Logic, Master's Programme (H2LOG)

Main field of studies

Logic

Specialization

A1N, Second cycle, has only first-cycle course/s as entry requirements

Entry requirements

For admission to the course, a Degree of Bachelor, or equivalent, in either philosophy, mathematics, linguistics, or computer science (or an equivalent subject) is required.

Acquaintance with basic mathematical logic, up to a presentation of the completeness theorem for first-order logic, is assumed.

Learning outcomes

On successful completion of the course the student will be able to:

Knowledge and understanding

- account for Kripke semantics for modal logic, including correspondence between modal formulas and properties of binary relationships.
- account for basic model theory of modal logic, e.g., connections between bisimulation and modal equivalence.
- account for some central applications of modal logic, e.g., epistemic logic, provability logic, or dynamic logic.

Competence and skills

- formulate, and present proofs of, the most important results in the course, including completeness, decidability and correspondence results, as well as of lemmas that are used in the proofs.
- formalise argumentation that is dependent on non truth-functional sentence operators.

Judgement and approach

- show awareness of the relationships between systems of modal logic and other types of logics.
- contrast an intensional and an extensional approach to modal logic.

Course content

The course gives a mainly semantically oriented introduction to modern modal propositional logic and Kripke semantics. It offers both a solid mathematical basis and an introduction to some of the many applications within, e.g., philosophy, metamathematics and computer science.

Example contents:

- Kripke semantics
- proof systems
- completeness theorems via canonical models, and refined constructions
- decidability
- incompleteness
- bisimulation and invariance
- correspondence between the validity of modal formulas and properties of binary relations

The course is mainly theoretically oriented, but also contains practical exercises.

Form of teaching

Teaching is given in the form of lectures, seminars, exercises, individual assignments and group assignments. Compulsory attendance can apply to certain course components, which is indicated in the course schedule.

Language of instruction: English

Assessment

The course is examined individually in written and/or oral form. There may be compulsory homework assignments during the course.

If a student, who has failed the same examined component twice, wishes to change examiner for the next examination, a written application shall be sent to the department responsible for the course and shall be granted unless there are special reasons to the contrary (Chapter 6, Section 22, Higher Education Ordinance).

In cases where a course has been discontinued or has undergone major changes, the student will normally be guaranteed at least three opportunities to take the examination (including the ordinary examination) during a period of at least one year from the last time the course was given.

Grades

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).

Course evaluation

The programme coordinator is responsible, in collaboration with the course coordinators, for systematically and regularly acquiring and compiling the students' evaluation of the course. Conclusions, and any actions taken, are presented to the students who carried out the evaluation, and are made available for students starting the course.