UNIVERSITY OF GOTHENBURG

DEPARTMENT OF PHILOSOPHY, LINGUISTICS AND THEORY OF SCIENCE

LOG270 Advanced Set theory, 7.5 credits

Avancerad mängdteori, 7,5 högskolepoäng

Second Cycle

Confirmation

This course syllabus was confirmed by Department of Philosophy, Linguistics and Theory of Science on 2021-11-08 and was last revised on 2022-12-22 to be valid from 2023-01-16, spring semester of 2023.

Field of education: Science 100%
Department: Department of Philosophy, Linguistics and Theory of Science

Position in the educational system

The course can be part of the following programme: 1) Logic, Master's (120 credits) programme (H2LOG) and can also be given as a freestanding course.

Main field of studies	*Specialization*
Logic	A1N, Second cycle, has only first-cycle course/s as entry requirements

Entry requirements

For admission to the course successful completion of Logical theory (LOG111) and Set theory (LOG121), or the equivalent, is required. English 6 or equivalent is also required.

Learning outcomes

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

Knowledge and understanding

- describe and demonstrate an understanding of results of relative consistency,
- demonstrate an understanding of set theory as a foundational system for mathematics,

Competence and skills

- formulate and present proofs of the relative consistency of Foundation, Replacement, the Continuum hypothesis and the Generalised Continuum hypothesis
- formulate, derive and apply results from advanced set theory, such as cardinal and ordinal arithmetic, definability, and reflection theorems,
- formulate and present proofs of the most important results in the course as well as of lemmas that are used in the proofs,

Judgement and approach

- critically discuss, analyse and evaluate results in the course as well as their applications.

Course content

The course covers results of relative consistency in the axiomatic set theory Zermelo-Fraenkel (ZF). By using internal models for set theory, the relative consistency of Foundation, Choice and the Continuum hypothesis (CH) are shown. The method of forcing is used to prove the independence of CH, as well as other cardinal axioms.

Form of teaching

Teaching is given in the form of lectures, seminars, exercises, individual assignments and group assignments.

Language of instruction: English

Assessment

The course is assessed individually in written and oral form through an oral presentation of parts of the course content and written home assignments. The marking teacher may request supplementation of the examined student performance.

If a student who has failed the same examined component twice wishes to change examiner before 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 of Higher Education Ordinance).

If a student has received a recommendation from the University of Gothenburg for special educational support, where it is compatible with the learning outcomes of the course and provided that no unreasonable resources are required, the examiner may decide to allow the student to sit an adjusted exam or alternative form of assessment.

If a course has been discontinued or has undergone major changes, the student shall

normally be guaranteed at least three examination occasions (including the ordinary examination) during a period of at least one year from the last course instance.

Grades

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

Course evaluation

Students who are currently taking the course or have completed it will be given the opportunity to express their views and share their experiences in an anonymous course evaluation. A compilation of the course evaluation and the course coordinator's reflections on it will be made available to the students within reasonable time after the end of the course. The next time the course is taught the compilation and any measures based on it will be presented to the students.

Additional information

The course requires access to a computer (or similar) with internet access.