DEPARTMENT OF PHILOSOPHY, LINGUISTICS AND THEORY OF SCIENCE

LOG120   Set theory, 7.5 credits

Mängdteori, 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	*Specialization*
Logic	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.

Learning outcomes

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

Knowledge and understanding
- describe and demonstrate an understanding of the central concepts, methods, and constructions in set theory.

- describe the various types of set theoretical objects that can be constructed using the different axioms, with a special focus on the axiom of choice.
- demonstrate an understanding of set theory as a sub-area of logic and contrast it with other areas of logic.
- at a general level account for the historical development of axiomatic set theory.

Competence and skills
- formulate and present set theoretical constructions of number systems including the natural and real numbers, as well as verify their most central properties using the axioms of set theory.
- formulate, derive and apply basic arithmetic for cardinal and ordinal numbers.
- 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 the results in the course as well as their applications.
- show awareness of the relationship between set theory and mathematics.

Course content
The course treats Zermelo-Fraenkel set theory, ZFC, formulated in first-order logic, beginning with a set theoretical construction of the natural and real number systems. Ordinal and cardinal numbers are presented and strong emphasis is placed on the cumulative hierarchy and on the role of the axiom of choice in the axiomatization of the concept of set.

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 form. In addition to the final written examination, there may also be compulsory home work 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.