



## DEPARTMENT OF PHILOSOPHY, LINGUISTICS AND THEORY OF SCIENCE

### **LOG010 Introduction to set theory, 7.5 credits**

Introduktion till mängdteori, 7,5 högskolepoäng

*First Cycle*

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#### **Confirmation**

This course syllabus was confirmed by Department of Philosophy, Linguistics and Theory of Science on 2019-05-31 to be valid from 2020-01-20, spring semester of 2020.

*Field of education:* Science 100%

*Department:* Department of Philosophy, Linguistics and Theory of Science

#### **Position in the educational system**

The course is offered as a freestanding course.

*Main field of studies*

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*Specialization*

G1N, First cycle, has only upper-secondary level entry requirements

#### **Entry requirements**

General entrance requirements

#### **Learning outcomes**

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

*Knowledge and understanding*

- describe and demonstrate a basic understanding of the central concepts, methods, and constructions in set theory,
- describe the various types of set theoretical objects that can be constructed using axioms,
- at a general level account for the historical development of axiomatic set theory,

*Competence and skills*

- formulate and present set theoretical constructions of the natural numbers as well as verify their most central properties by means of the axioms of set theory,
- formulate and derive basic properties concerning cardinality and well-orderings,
- formulate and present proof of the most important results in the course,

*Judgement and approach*

- show awareness of the relationship between set theory and mathematics.

**Course content**

The course treats Zermelo-Fraenkel's set theory, ZFC, formulated in first-order logic and take its starting point in the set theoretical construction of the natural numbers and how set theory can constitute a foundation for mathematics. Furthermore, properties of infinite sets are treated, with a focus on cardinality and properties of well-orderings. The cumulative hierarchy is discussed as well as the role of the axiom of choice in the axiomatisation of the concept of set.

**Form of teaching**

The course is a distance course. Recorded lectures are made available during the course and followed up to mandatory quizzes in the form of digital tests.

*Language of instruction:* English

**Assessment**

The course is assessed individually in written form. In addition to the final written examination, there will also be compulsory home work assignments.

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).

In cases where a course has been discontinued or has undergone major changes, the student shall normally be guaranteed at least three examination sessions (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 course coordinator is responsible 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.