



AK2001 Mathematics and Reality 7.5 credits

Matematiken och verkligheten

This is a translation of the Swedish, legally binding, course syllabus.

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

Course syllabus for AK2001 valid from Spring 2011

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Built Environment

Specific prerequisites

University studies corresponding to at least 120 credits (two full years).

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

Upon completion of the course, the student should be able

- to account for central concepts and questions in the philosophy of mathematics;
- to recount and contrast the standpoints of historically important thinkers and schools in the philosophy of mathematics;
- to describe in outline the content and philosophical significance of technical notions and results such as decidability, formal deduction, Russell's antinomy, and Gödel's incompleteness theorems; and
- to engage in critical written reflection on such primary texts in philosophy of mathematics as are included in the course literature.

Course contents

This course is about the relation between mathematics and reality from two perspectives. First, there are questions within mathematics: What does it mean to say that mathematical propositions are true? What does it mean to say that they are provable? Are there mathematical objects? Is a mathematical theory nothing but its axioms? Has mathematics a secure foundation? Secondly, there are questions about the relation between mathematics and the physical reality. How come we are able to use mathematics in order to increase our knowledge of physical reality and to manipulate it? Has the world a structure that can be described mathematically? What is the relation between mathematical entities and operations such as numbers, lines, sets, addition, differentiation and physical quantities and practices for counting, measuring, etc.?

Disposition

Lectures 20 h

Tutorials 10 h

Course literature

Course literature will be posted on the course home page no later than four weeks before the course starts.

Examination

- INL1 - Assignment, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Examination, 4.5 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.