



# SF1671 Mathematics, Basic course, with Discrete Mathematics 7.5 credits

Matematik, baskurs, med diskret matematik

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 SF1671 valid from Autumn 2015

## Grading scale

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

## Education cycle

First cycle

## Main field of study

Technology

## Specific prerequisites

Basic and specific requirements for engineering program.

# Language of instruction

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

## Intended learning outcomes

After completing this course with a passing grade the student should be able to

- Perform simple logical reasoning to draw correct conclusions from calculations or supplied data.
- Present calculations and arguments in such a way that they are easy to follow even for someone who is not already familiar with the problem.
- Understand, use and derive simple properties and relationships between concepts covered in the course.

In addition, students must have embraced a study technique that facilitates further mathematical studies.

## Course contents

Basic methods and notations for mathematical reasoning.

Sets and set operations, the important set of numbers.

Induction and recursion over the natural numbers. The binomial theorem and sums.

Linear recursion.

Binary relations and their important properties, especially equivalence relations and order relations.

The integers; bases, divisibility, greatest common divisor and least common multiple, the Euclidean algorithm; primes, unique factorization.

Modular arithmetic; modulo calculations and residual classes, inverses; Chinese remainder theorem.

Functions; surjections, injections, bijections; inverse functions.

Cardinality.

The trigonometric functions and their inverses, power, exponential and logarithmic functions, absolute value function.

## Examination

- TEN1 - Exam, 7.5 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.

## **Other requirements for final grade**

Written exam, possibly with the possibility of continuous examination.

## **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.