



# SF1610 Discrete Mathematics

## 7.5 credits

### 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 SF1610 valid from Spring 2009

### Grading scale

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

### Education cycle

First cycle

### Main field of study

Mathematics, Technology

### Specific prerequisites

Elementary linear algebra.

### Language of instruction

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

## Intended learning outcomes

The overall goal is to give basic knowledge in Discrete mathematics, in particular a good knowledge in elementary combinatorics, knowledge of some abstract algebraic structure and the use of it, and a good knowledge of some selected topics in graph theory.

After the course it is expected that the student will have achieved a better ability for learning, treating and applying mathematics in general. As the solution of mathematical problems is a method used to learn mathematics, it is expected that the student also will have got a better ability to solve problems in general.

## Course contents

The fundamental theorem of arithmetics, the Euclidian algorithm and a Diophantine equation. Modular arithmetics, Fermat's theorem and RSA. Sets, functions, infinite sets and cardinal numbers, the pigeonhole principle. Proof by induction and recursions. Elementary group theory as the theorem of Lagrange and in particular the symmetrical group. Boolean algebra. Error correcting codes and in particular Hamming codes. Combinatorics, binomial and multinomial numbers, Stirling numbers, the sieve principle. Elementary graph theory, Eulerian and Hamiltonian graphs, matchings in bipartite graphs, planar graphs.

## Course literature

K.Eriksson och H.Gavel: Diskret matematik och diskreta modeller.

H.Gavel;K.Eriksson/Diskret matematik fördjupning.

## Examination

- TEN1 - Examination, 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.

TEN1 - Examination, 7.5 credits, grade scale: A, B, C, D, E, FX, F

## 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.

