SF1662 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 SF1662 valid from Autumn 2011

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.
Mandatory for first year, can not be read by other students

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 of Discrete mathematics, in particular a fair knowledge of elementary combinatorics, knowledge of some abstract algebraic structures and the use of them, 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.

Course contents

The Euclidian algorithm and Diophantine equations. The Euclidean algorithm for polynomials and Gaussian integers. The Fundamental theorem of arithmetic. Modular arithmetic. Fermat's theorem and RSA.
Recursion and proof by induction. Sets, functions, infinite sets and cardinal numbers. Elementary boolean algebra.
Combinatorics and probabilities. The addition and multiplication principles, the pigeonhole principle, binomial and multinomial numbers, Stirling numbers, the sieve principle.
Elementary group theory, cyclic groups, subgroups and cosets, the theorem of Lagrange. Permutations, the symmetric group.
Elementary graph theory, Eulerian and Hamiltonian graphs, trees, planar graphs, vertex colorings, matchings in bipartite graphs.

Course literature

K.Eriksson och H.Gavel: Diskret matematik och diskreta modeller.
K.Eriksson och H.Gavel:Diskret matematik fördjupning.
Supplementary material distributed during the course.

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.

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.