IX1503 Discrete Mathematics for Business Engineering 7.5 credits

Diskret matematik för affärssystem

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 IX1503 valid from Autumn 2011

Grading scale

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

Education cycle

First cycle

Main field of study

Mathematics,Technology

Specific prerequisites

Completed upper secondary education including documented proficiency in Swedish corresponding to Swedish B and English corresponding to English A. For students who received/will receive their final school grades after 31 December 2009, there is an additional entry requirement for mathematics as follows: documented proficiency in mathematics cor-

responding to Mathematics A, and the specific requirements corresponding to Mathematics C, Civics A, Physics A and Chemistry A, and the specific requirements corresponding to Mathematics C, Civics A, Physics A and Chemistry A

Language of instruction

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

Intended learning outcomes

GENERAL OBJECTIVES

After course completion the student should be able to

- formulate, analyze and solve problems in discrete mathematics significant to in the ICT sphere

- apply and develop discrete models with the aid of mathematical programming language

- review and comment a given solution to a problem- comment a discrete model and propose improvements

- make presentations of solutions of a discrete problem

DETAILED OBJECTIVES

After course completion the student should be able to

- compute the number of possibilities with simple selection principles (order/recurrence)

- compute permutations and combinations

- use set notations and Venn Diagrams

- decide whether a function is surjective, injective or bijective

- characterize relations in important classes, e.g. equivalence relation and partial order

- set up recursive models

- solve difference equations and use recursion when solution is not possible

- determine the minimum spanning tree

- determine shortest path in graphs

- set up graph models in problem solving (e.g. optimization and coloring)

Course contents

Combinatorics and sets. Integers, divisibility, induction, recursionfunctions and relations. Number sequences, sums and difference equations. Graph theory, trees, walks and searches. Eulerian graphs, Hamiltonian graphs, planar graphs, coloring and chromatic number

Course literature

Lars-Christer Böiers, Diskret Matematik, Studentlitteratur, 2003

Lars-Christer Böiers, Diskret Matematik Övningsbok, Studentlitteratur, 2003

Examination

- INL1 - Assignment, 4.0 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Examination, 3.5 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.

Written exam (TEN1; 3,5 hp)

Problem assignments (INL1; 4 hp)

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.