IX1304 Calculus 7.5 credits

Matematik, analys

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

Establishment

Course syllabus for IX1304 valid from Autumn 2008

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 corresponding to Mathematics A. And the specific requirements of mathematics, physics and chemistry corresponding to Mathematics D, Physics B and Chemistry A.

Language of instruction

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

Intended learning outcomes

After course completion the student should be able to- formulate, analyze and solve problems in calculus significant to the ICT sphere- apply and develop mathematical calculus models with the aid of mathematical programming language- review and comment a given solution to a problem- comment domain, accuracy, stability and propose improvements to a mathematical model

DETAILED OBJECTIVES

After course completion the student should be able to- explain how positional numeral systems works and explain the difference between rational and a real numbers- create and use models involving limits, derivatives and series expansions- describe the Riemann integral and its geometric interpretation- solve optimization problems with one or several variables using partial derivatives- create and use models involving differential equations- solve simple differential equations- explain how transforms are used to simplify the problem solving- with the aid of computers . compute limits, derivatives, integrals and series expansions . solve optimization problems, e.g. Lagrange multipliers . solve problems using numerical methods, e.g. Newton's method

Course contents

Positional numeral systems, real numbers__rules of derivatives__limits__series, convergence and divergence__Taylor series__Riemann integrals__primitive functions, the method of substitution__partial derivatives__extreme value problems with one or several variables__multiple integrals__iterative and numerical methods__dynamic systems__metrics__differential equations__introduction to transforms

Disposition

The teaching method is problem oriented and computer aided. The education time is evenly distributed among the three main topics- conceptual understanding and modelling- algorithms- conclusions and synthesis.

Examination

- INL1 - Problem Assignments, 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.

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

Other requirements for final grade

Written exam (TEN2; 4hp)**Problem assignments (INL1; 3.5hp)**

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.