



# IX1300 Introduction in Mathematics 7.5 credits

## Introduktion i 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 IX1300 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

## 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 mathematical problems significant to the ICT sphere with in-depth knowledge of concepts and methods of the upper secondary school mathematics- translate the mathematical model into mathematical programming language- analyze, review and make conclusions from a solution

**DETAILED OBJECTIVES** After course completion the student should be able to- draw trigonometric functions and use these functions as models describing real periodic processes- derive and use formulas needed in order to reformulate simple trigonometric expressions and solve trigonometric equations- explain rules of derivative of a function and derive some of them, e.g. derivative of a composition and the product rule, and use these rules in problem solving- use the second derivative in applications- explain the integral concept and clarify the connection between integral and derivative and be able to set up, interpret and use integrals in different fundamental applications- use mathematical models where arithmetic or geometric sequences are involved- work with problems, that demands an overview of knowledge acquired in algebra, trigonometry and basic calculus- with the aid of computers . illustrate data sets . plot functions . make function fits to given data . compute limits, derivatives and integrals . solve equations . make simple simulations and estimate probabilities . define and illustrate number sequences

## Course contents

Repetition in in-depth studies of upper secondary school mathematics- interpretation and manipulation of algebraic expressions power function, exponential function, logarithms quadratic expressions, completing the square, equations and inequalities, polynoms, factoring, limits, derivative basic probability theory and statistics. Introduction to mathematical programming assignments and defining functions, plotting functions and derivatives, log-arithmic scale, solving equations, plotting data sets, mean and standard deviation, simple random experiments, function fits to a data set. Trigonometric functions solving trigonometric equations, periodic processes, Second derivative inflexion point, acceleration Primitive functions Integrals interpretation as area and mean Number sequences arithmetic, geometric sequences, recursive sequences, sums and geometric series

## Examination

- INL1 - Assignments, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Examination, 1.5 credits, grading scale: P, F
- TEN2 - Examination, 3.0 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 mathematical programming language (TEN1; 1.5hp) Written exam (TEN2; 3hp) Problem assignments (INL1; 3hp)**

## 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.