



## Course syllabus

Faculty of Technology

Department of Mathematics

1MA102 Analys I, 7,5 högskolepoäng

Calculus I, 7.5 credits

**Main field of study**

Mathematics

**Subject Group**

Mathematics

**Level of classification**

First Level

**Progression**

G1N

**Date of Ratification**

Approved 2009-08-11

Revised 2014-10-14 by Faculty of Technology. Examination and required reading are revised.

The course syllabus is valid from spring semester 2015

**Prerequisites**

General entry requirements and Mathematics 3c or Mathematics D (Field-specific entry requirements 8/A8).

## Objectives

The student should be able to:

- perform computations with limits, derivatives and integrals.
- interpret and use elementary functions and equations.
- sketch graphs and solve extreme value problems.
- solve simple types of differential equations.
- use derivatives and integrals in problem solving.
- describe definitions and derive relations between central concepts of the course and apply these relations to solve problems.
- derive simple relations within the area of limits, derivatives and integrals.
- interpret, communicate and argue using mathematic notions.

## Content

- Limits and continuity: Definition of limit, rules for calculation, the Squeeze Theorem, standard limits, the number  $e$ , continuity.
- Derivatives and function studies: Definition of derivative, rules for calculation, the derivatives of the elementary functions, the Mean-Value Theorem, extreme value problems, sketching the graph of a function, asymptotes.
- Integrals: Antiderivatives, definition of integral, the Fundamental Theorem of Calculus, the Mean-Value Theorem for Integrals, integration by parts, substitutions, integrals of rational functions.
- Differential equations: First order linear DE, separable DE, second order linear DE with constant coefficients.

## Type of Instruction

Teaching methods Lectures and seminars. Compulsory assignments may be given during the course.

## Examination

The course is assessed with the grades Fail (U), Pass (G) or Pass with Distinction (VG).

The student's knowledge is assessed in the form of written examinations, which involve both computation and theory questions.

On request, students may have their credits translated to ECTS-marks. Such a request must be sent to the examiner before the grading process starts.

## Course Evaluation

A course evaluation will be carried out at the end of the course in accordance with the guidelines of the University. The result of the course evaluation will be filed at the department.

## Required Reading and Additional Study Material

Robert A. Adams. *Calculus – A Complete course*, Addison-Wesley Educational Publishers, 6th edition, 2005 or later.  
300(1020) pages.

Material from the department