



## Course syllabus

Faculty of Technology

Department of Mathematics

1MA402 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 2015-05-22

Revised 2019-03-13 by Faculty of Technology. Prerequisites and content are revised.

The course syllabus is valid from autumn semester 2019

### **Prerequisites**

General entry requirements and Mathematics 4 or Mathematics E (Field-specific entry requirements 9/A9).

## Objectives

After completing the course, the student should be able to

- solve problems, perform calculations, and conduct lines of reasoning within the part of mathematics that is covered by the course, and to communicate these solutions, calculations, and reasonings in writing
- describe definitions, and formulate and prove theorems that are central to the course.

## Content

- Equations and inequalities, the fundamental theorem of algebra, polynomial division.
- Elementary functions.
- Limits and continuity: Definition of limit, rules for calculation, the Squeeze Theorem, standard limits, 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.
- Antiderivatives.
- Differential equations: Linear and separable first order differential equations, linear second order differential equations with constant coefficients.

## Type of Instruction

Lectures and seminars.

## Examination

The course is assessed with the grades A, B, C, D, E, Fx or F.

The grade A constitutes the highest grade on the scale and the remaining grades follow in descending order where the grade E is the lowest grade on the scale that will result in a pass. The grade F means that the student's performance is assessed as fail (i.e. received the grade F).

The student's knowledge is assessed in the form of written examinations.

## Course Evaluation

During the course or in close connection to the course, a course evaluation is to be carried out. The result and analysis of the course evaluation are to be communicated to the students who have taken the course and to the students who are to participate in the course the next time it is offered. The course evaluation is carried out anonymously. The compiled report will be filed at the Faculty.

## Credit Overlap

The course cannot be included in a degree along with the following courses of which the content fully, or partly, corresponds to the content of this course: 1MA102 Calculus I, 7.5 credits.

## Other

Grade criteria for the A–F scale are communicated to the student through a special document. The student is to be informed about the grade criteria for the course by the start of the course at the latest.

## Required Reading and Additional Study Material

Robert Adams. *Calculus – A Complete course*, Addison-Wesley Educational Publishers, latest edition, expected reading 270/1020 pages.

Material from the department

### **Additional reading**

Kevin Houston, *How to think like a Mathematician*, Cambridge Uni. Press, latest edition.