



**LUNDS UNIVERSITET**  
Lunds Tekniska Högskola

*Course syllabus*

# Endimensionell analys A1 Calculus in One Variable A1

**FMAB45, 5 credits, G1 (First Cycle)**

**Valid for:** 2023/24

**Faculty:** Faculty of Engineering, LTH

**Decided by:** PLED F/Pi

**Date of Decision:** 2023-04-18

## General Information

**Main field:** Technology.

**Compulsory for:** BME1, M1, MD1

**Language of instruction:** The course will be given in Swedish

## Aim

The aim of the course is to give a basic introduction to calculus in one variable. The aim is also to develop the student's ability to solve problems, to assimilate mathematical text and to communicate mathematics.

## Learning outcomes

### *Knowledge and understanding*

For a passing grade the student must

- within the framework of the course with confidence be able to handle elementary functions of one variable.
- be familiar with the logical structure of mathematics, in the way it appears e.g. in plane geometry.
- be able to account for the contents of definitions, theorems and proofs.

### *Competences and skills*

For a passing grade the student must

- be able to demonstrate a good algebraic computational ability.
- be able to demonstrate an ability to explain mathematical reasoning in a structured and logically clear way.

## Contents

The number concept. Calculation with fractions. Inequalities. Square roots. Curves and equations of degree 2. Geometry in the plane. Analytic geometry. The circle, ellipse, hyperbola. Arithmetic and geometric sums. The binomial theorem. The modulus of a number. Trigonometry. Powers and logarithms. The concept of a function. The properties of the elementary functions: graphs, formulas. Sequences of numbers.

## Examination details

**Grading scale:** TH - (U,3,4,5) - (Fail, Three, Four, Five)

**Assessment:** Written test comprising theory and problem solving. Computer quizzes. An oral assignment. ONLY STUDENTS WHO PASSED ON THE COMPUTER QUIZZES AND THE ORAL ASSIGNMENT MAY PARTICIPATE IN THE WRITTEN TEST.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

### Parts

**Code:** 0121. **Name:** Written Examination.

**Credits:** 5. **Grading scale:** TH. **Assessment:** Written test comprising theory and problem solving. The computer quizzes must be passed before the examination. The assignment (oral and in writing) must be passed before the examination.

**Code:** 0221. **Name:** Assignment.

**Credits:** 0. **Grading scale:** UG.

**Code:** 0321. **Name:** Computer Quizzes.

**Credits:** 0. **Grading scale:** UG.

## Admission

**The number of participants is limited to:** No

**The course overlaps following course/s:** FMA410, FMA415, FMA645, FMAA05, FMAA50, FMAA01, FMAB65

## Reading list

- Diehl, S: Inledande geometri för högskolestudier. Studentlitteratur, 2015. Chapters P,T, A.
- Övningar i Inledande geometri för högskolestudier. Studentlitteratur, 2015, ISBN: 9789144067865.
- Månsson, J. och Nordbeck, P.: Endimensionell analys. Studentlitteratur, 2011, ISBN: 9789144056104.
- Övningar i endimensionell analys. Studentlitteratur, 2018, ISBN: 9789144127187.

## Contact and other information

**Course coordinator:** Studierektor Anders Holst, Studierektor@math.lth.se

**Course administrator:** Studerandeexpeditionen, expedition@math.lth.se

**Teacher:** Pelle Petterson, Pelle.Petterson@math.lth.se

**Course homepage:** <https://canvas.education.lu.se/courses/20300>

**Further information:** Calculus in One Variable is taught and examined in three different

variants for the Master of Science in Engineering programmes, Track A (the courses Calculus in One Variable A1-A3), Track B (the courses Calculus in One Variable B1-B2) and Track Beta (Calculus in One Variable Beta 1 and B2), depending on the study programme. In case a student changes study programme the different tracks are considered exchangeable. Before the written retake exams it will be possible to retake the computer test or the assignment, if needed.