



# LT1000 Calculus for Teachers

## 7.5 credits

### Matematisk analys för lärare

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

On 2021-10-15, the Dean of the ITM school has decided to establish this official course syllabus to apply from autumn term 2022 (registration number M-2021-1849).

### Grading scale

A, B, C, D, E, FX, F

### Education cycle

First cycle

### Main field of study

Technology

### Additional regulations

Overlapping course

HF1006, HF1008, IX1304, SF1625, SF1685, ML1000, partly overlapping

## Specific prerequisites

General entry requirements.

## Language of instruction

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

## Intended learning outcomes

After passing the course, the student should be able to:

1. perform operations on functions
2. Explain when a function has an inverse and how one can find the inverse
3. Explain how one can outline the graph of a function, based on transformation of graphs (vertical and horizontal shifts)
4. Explain the concepts of limit and continuity
5. Examine the concepts and the processes for derivation and integration of functions of one variable,
6. Outline and interpret function graphs carefully by using differential calculus
7. Use mathematical analysis to find maxima and minima, and calculate the area below a given curve
8. Develop creative and innovative ways to teach mathematical analysis in primary and lower-secondary school

## Course contents

This course is designed to help the students to develop an understanding of the fundamentals of mathematical analysis of functions of one variable and its applications. Focus will be put on exploring real applications where the students are expected to use their mathematical knowledge, knowledge from the concepts in mathematical analysis, and methods to solve applied problems and make decisions. Content that is brought up:

- Functions
- The Cartesian coordinate plane and distance (the gradient of a line, the equation of the line, parallel and perpendicular lines)
- Change rate (shift, velocity and acceleration)
- Limits and continuity.

- The meaning of mathematical analysis and its applications (differences between differential and integral calculus)
- Leibniz's notation

## Examination

- KON1 - Partial examinations, 2.0 credits, grading scale: A, B, C, D, E, FX, F
- PRO1 - Project, 2.0 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Written 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.

## Other requirements for final grade

- At group project, all have in the group responsibility for the work of the group.
- At examination, each student should honestly report help that has been received and sources that have been used.
- At oral examination, each student should be able to give an account of the whole assignment and the whole solution.

## 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.