



ML0021 Mathematics for Technical Preparatory Year I 12.0 fup

Matematik för basår I

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

The official course syllabus is valid from the autumn semester 2025 as decided by the Faculty Board: dnr PA-2025-0010. Decision date: 2025-08-27

Grading scale

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

Education cycle

Pre-university level

Specific prerequisites

Intended learning outcomes

The overall goal of the course is to give new students enough skills and understanding that is required to be able to follow the mathematical courses that are included in the 3- and 5-year engineering programs. The courses should also contribute to a good introduction to higher education.

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

- use theorems and methods on mathematical problems and communicate the mathematical argumentation in writing.

'Mathematical' refers to the part of the mathematics that is included in the course content.

Course contents

MODULE A: TENA

- Vectors; Arithmetical operations. Components of vectors. Coordinates. Vector length.
- Algebraic expression and algebraic methods; Implication and equivalence. Polynomial. Powers. Square roots. Absolute value. Equations. Factorial polynomials Rational expressions. Linear equation systems. Linear inequalities.
- Functions; Linear functions. Direct proportionality. Quadratic functions. Power functions.
- Right-angle trigonometry.
- Uniformity; Triangle theorems Area and volume scale factors.

MODULE B: TENB

- Exponential functions.
- Logarithms; Logarithm laws. Natural logarithms.
- Derivatives; Change rates. Limits. The definition of the derivative. Derivation rules.
- Derivatives and graphs; Extreme points and extreme values. Increasing and decreasing. Maximum and minimum values. Second derivative.
- The equation of the circle.
- Area theorem. Sine law. Cosine law.

Examination

- TENB - Written examination, 6.0 fup, grading scale: A, B, C, D, E, FX, F
- TENA - Written examination, 6.0 fup, 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.

If the course is discontinued, students may request to be examined during the following two academic years.

Other requirements for final grade

Final grades are based on the total number of points from both examinations.

For final grade, it is required that all examination parts are approved.

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.