



# 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

Course syllabus for ML0021 valid from Autumn 2016

## Grading scale

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

## Education cycle

Pre-university level

## Specific prerequisites

The upper-secondary school from 1 July 2011 and adult education at upper-secondary level from 1 July 2012 (Gy2011):

- Mathematics 2a, 2b, 2c or Mathematics B

## Language of instruction

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

## Intended learning outcomes

On completion of the course, the student should be able to:

- formulate, analyse and solve mathematical problems in the area and to explain the mathematical reasoning in writing. The problems can be based on realistic situations and/or include handling of mathematical procedures of standard character.

## Course contents

### Module A

- 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

- 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.