TB0021 Mathematics for Technical Preparatory Year, online with meetings on campus I 12.0 fup

Matematik för basår, distans med campusträffar I

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

The official course syllabus is valid from the spring semester 2022 according to a decision by the Vice President for Education: V-2022-0012.

Decision to discontinue this course

The course is discontinued at the expiration of the spring semester 2024 according to a decision by the Vice President for Education: V-2022-0012.Decision date: 18/01/2022The course was given for the last time during the autumn semester 2021. Final opportunity for examination in the course will be given during the spring semester 2024.The examination in the course is carried out as written examination. At least two examination dates per academic year are offered until and including the spring semester 2024.For information about when examination is given, when exam registration is possible and for exam registration please refer to the KTH web. Questions are referred to the Department of Sustainable production development via service-hpu@kth.se

Grading scale

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

Education cycle

Pre-university level

Specific prerequisites

Language of instruction

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

Intended learning outcomes

The overall goal of the course is to give new students enough skills and understanding 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

COURSE UNIT A: TENA

- Vectors; Arithmetical operations. Components of vectors. Coordinates. Vector length.
- Algebraic expressions and algebraic methods; Implication and equivalence. Polynomials. Exponentiations. Square roots. Absolute values. Equations. Factorial polynoms. Rational expressions. Linear equation systems. Linear inequalities.
- Functions; Linear functions. Direct proportionality. Quadratic functions. Exponential functions.
- Right-angle trigonometry.
- Uniformity; Similar triangles. Intercept theorem. Area and volume scale factors.

COURSE UNIT 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. Law of sines. Law of cosines.

Examination

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

Other requirements for final grade

Final grades are based on the total number of points from both written examinations. For final grade, it is required that all examination parts are passed.

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.