Course syllabus

Tekniskt basår: Matematik 3c Pre-University Course in Technical Sciences: Mathematics 3c

TBAA05, 13 credits, G1 (First Cycle)

Valid for: 2023/24
Faculty: Faculty of Engineering, LTH
Decided by: PLED TB
Date of Decision: 2023-04-19

General Information

Compulsory for: TNB1-TEBA
Language of instruction: The course will be given in Swedish

Aim

The purpose of the course is to complement an upper secondary school education in Mathematics 3c,

Learning outcomes

Knowledge and understanding
For a passing grade the student must

Does not exist in this form.

Competences and skills
For a passing grade the student must

Does not exist in this form.

Judgement and approach
For a passing grade the student must

Does not exist in this form.

Contents

- Basic calculating: arithmetics with known numbers, rational numbers, algebraic calculations, formulae, powers, square roots and completing squares.

- The concept of absolute values.
- The concepts of polynomial and rational expressions, and generalization of the laws of arithmetic for dealing with these concepts.
- Properties of the equation of a circle and unit circle in defining trigonometric concepts.
- Proof and use of cosine, sine and area theorems for an arbitrary triangle.
- Orientation to continuous and discrete functions, as well as the concept of limits.
- Properties of polynomial functions of higher orders.
- The concepts of secant, tangent, rate of change and derivatives of a function.
- Derivation and use of the rules of derivation for power and exponential functions, and also sums of functions.
- Introduction of the number "e" and its properties.
- Algebraic and graphical methods for determining the value of the derivative of a function.
- Algebraic and graphical methods for solving extreme value problems using sign tables and second derivatives.
- Relationship between the graph of a function and the first and second derivatives of a function.
- The concept of antiderivatives and definite integrals and the relationship between integrals and derivatives.
- Determining simple integrals in applications relevant for subjects typical of programmes.
- Strategies for mathematical problem solving.
- Mathematical problems of importance in societal life and applications in other subjects.
- Mathematical problems related to the history of mathematics.
- Programming (Python).

Examination details

Grading scale: UG - (U,G) - (Fail, Pass)
Assessment: Written examination and passed parts.

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: 0120. **Name:** Written Exam.
Credits: 12. **Grading scale:** UG. **Assessment:** Written examination.
Code: 0220. **Name:** Programming.
Credits: 1. **Grading scale:** UG. **Assessment:** Compulsory attendance and approved reports.

Admission

The number of participants is limited to: No

Reading list

- Alfredsson m fl: Matematik 5000+, kurs 3c, Basåret Lärobok. Natur&Kultur, 2019, ISBN: 9789127457157.
- Alfredsson m fl: Matematik 5000+, kurs 3c, Basåret Lärobok Digital. Natur&Kultur, 2019, ISBN: 9789127457744. Alternative litterature.

Contact and other information

Course coordinator: Jenny Olsson, jenny.olsson@math.lth.se
Course homepage: http://www.lth.se/utbildning/tekniskt-basar/
Further information: The scope for this course is expressed in access education credits (fup).