



LUNDS UNIVERSITET
Lunds Tekniska Högskola

Course syllabus

Tekniskt basår: Matematik 4

Pre-University Course in Technical Sciences: Mathematics 4

TBAA10, 9 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, TNB1-NABA

Language of instruction: The course will be given in Swedish

Aim

The purpose of the course is to complete an upper secondary school education in Mathematics 4.

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

Mathematics 4, Part a

- Handling trigonometric expressions, and proof and use of trigonometric formulae including the Pythagorean trigonometric identity and the addition formulae.
- Algebraic and graphical methods for solving trigonometric equations.
- Properties of trigonometric functions, logarithmic functions, compound functions and absolute amounts as functions.
- Drawing graphs and their related asymptotes.
- Derivation and use of the rules of derivation for trigonometric, logarithmic, exponential and compound functions, and also the product and quotients of functions.
- The concept of differential equations and their properties in simple applications that are relevant to subjects typical of programmes.
- Strategies for mathematical problem solving including the use of digital tools and programming.
- Mathematical problems of importance in societal life and applications in other subjects.
- Mathematical problems related to the history of mathematics.

Mathematics 4, Part b

- Methods of calculating complex numbers written in different forms including rectangular and polar forms.
- The complex number plane, representation of complex numbers as points and vectors.
- Conjugates and absolute amounts of a complex number.
- Use and proof of de Moivre's formula.
- Algebraic and graphical methods for solving simple polynomial equations with complex roots and real polynomial equations of higher degrees, also by means of the factor theorem.
- Properties of trigonometric functions, logarithmic functions, compound functions and absolute amounts as functions.
- Algebraic and graphical methods for determining integrals with and without digital tools, including estimates of magnitudes.
- Different methods of proof in mathematics, with examples from the areas of arithmetic, algebra or geometry.
- Strategies for mathematical problem solving including the use of digital tools and programming.
- Mathematical problems of importance in societal life and applications in other subjects.
- Mathematical problems related to the history of mathematics.

Examination details

Grading scale: UG - (U,G) - (Fail, Pass)

Assessment: Written examinations

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, Part a.

Credits: 4,5. **Grading scale:** UG. **Assessment:** Written examination.

Code: 0220. **Name:** Written Exam, Part b.

Credits: 4,5. **Grading scale:** UG. **Assessment:** Written examination.

Admission

The number of participants is limited to: No

Reading list

- Alfredsson m fl: Matematik 5000+, kurs 4, Lärobok, Digital. Natur&Kultur, 2020, ISBN: 9789127458246. Alternative litterature.
- Alfredsson m fl: Matematik 5000+, kurs 4, Lärobok. Natur&Kultur, 2020, ISBN: 9789127455771.

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).