



LUNDS UNIVERSITET  
Lunds Tekniska Högskola

*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](mailto: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).