Foundation Course in Mathematics

Programme course

6 credits

Matematisk grundkurs

TATB03

Valid from: 2021 Spring semester

Determined by
Board of Studies for Industrial Engineering and Logistics

Date determined
2020-09-29

Main field of study
Mathematics, Applied Mathematics

Course level
First cycle

Advancement level
G1X

Course offered for
- Asian Studies - China
- Asian Studies - Japan

Intended learning outcomes
It is important that you acquire general mathematical accuracy and a stable foundation for your continued studies. After the course is completed you should be able to:

- read and comprehend mathematical texts.
- perform standard calculations with accuracy.
- handle calculations with algebraic expressions, inequalities and absolute values.
- solve polynomial equations and equations containing square roots.
- analyze how the concepts domain, range, injectivity and composition relate to particular functions.
- define and draw the graphs of the elementary functions: the natural logarithm, exponential-, power-, trigonometric- and inverse trigonometric functions.
- use and prove laws and formulas for the elementary functions.
- work with complex numbers in cartesian and polar form.
- define the complex exponential function and use and prove Euler's and deMoivre's formulas.
- solve problems concerning straight lines and circles in the plane.
- perform logical arguments
- work with geometric and arithmetic sums.
- check results and partial results in order to verify their correctness or reasonableness.

Course content

Algebraic expessions, inequalities, modulus, complex numbers. Solving equations. Functions and graphs. Definitions and properties of the elementary functions: natural logarithm, exponential function, power function, trigonometric functions and complex exponential function, arcus functions. The Euler formulas. Basic principles of logic. Different types of proof techniques. Coordinate systems in the plane. Polar coordinates. Lines and circles. The complex plane. Complex numbers in polar form. Inverse trigonometric functions.

Teaching and working methods

Problem classes, tutorials, and a few lectures.

Examination

TEN3	Written examination	4.5 credits	U, 3, 4, 5
TEN2	Written examination	3 credits	U, 3, 4, 5
TEN1	Written examination	1.5 credits	U, 3, 4, 5
UPG1	Hand-in assignments	1.5 credits	U, G

Either TEN1 and TEN2, or the summary examination TEN3 is required. Grades are given based on the results from TEN1 and TEN2 or the result from TEN3. Attempts to improve grades are only allowed in TEN3.

Grades

Four-grade scale, LiU, U, 3, 4, 5

Other information

About teaching and examination language

The teaching language is presented in the Overview tab for each course. The examination language relates to the teaching language as follows:

- If teaching language is Swedish, the course as a whole or in large parts, is taught in Swedish. Please note that although teaching language is Swedish, parts of the course could be given in English. Examination language is Swedish.
- If teaching language is Swedish/English, the course as a whole will be taught in English if students without prior knowledge of the Swedish language participate. Examination language is Swedish or English (depending on teaching language).
- If teaching language is English, the course as a whole is taught in English. Examination language is English.

Other

The course is conducted in a manner where both men's and women's experience and knowledge are made visible and developed.

The planning and implementation of a course should correspond to the course syllabus. The course evaluation should therefore be conducted with the course syllabus as a starting point.

Department

Matematiska institutionen

Director of Studies or equivalent

Jesper Thorén

Examiner

Jonas Bergman Ärlebäck

Course website and other links

Education components

Preliminary scheduled hours: 78 h
Recommended self-study hours: 82 h

Course literature

Books

G. Forsling, M. Neymark, *Matematisk analys, en variabel* Liber

Other