

## Foundation Course in Mathematics

Matematisk grundkurs  
6 credits

Programme course

TATB03

Valid from: 2022 Spring semester

<b>Determined by</b>	<b>Main field of study</b>	
Board of Studies for Industrial Engineering and Logistics	Mathematics, Applied Mathematics	
<b>Date determined</b>	<b>Course level</b>	<b>Progressive specialisation</b>
2021-09-01	First cycle	G1X
<b>Revised by</b>	<b>Disciplinary domain</b>	
	Natural sciences	
<b>Revision date</b>	<b>Subject group</b>	
	Mathematics	
<b>Offered first time</b>	<b>Offered for the last time</b>	
Autumn semester 2020		
<b>Department</b>	<b>Replaced by</b>	
Matematiska institutionen		

## 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 expressions, 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 could be given in Swedish, or partly in English. Examination language is Swedish, but parts of the examination can be in English.
- If teaching language is “English”, the course as a whole is taught in English. Examination language is English.
- 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.

### 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.

If special circumstances prevail, the vice-chancellor may in a special decision specify the preconditions for temporary deviations from this course syllabus, and delegate the right to take such decisions.