

Foundation Course in Mathematics

Matematisk grundkurs
6 credits

Programme course

TNA001

Valid from: 2022 Spring semester

Determined by	Main field of study	
Board of Studies for Electrical Engineering, Physics and Mathematics	Mathematics, Applied Mathematics	
Date determined	Course level	Progressive specialisation
2021-09-01	First cycle	G1X
Revised by	Disciplinary domain	
	Natural sciences	
Revision date	Subject group	
	Mathematics	
Offered first time	Offered for the last time	
Autumn semester 2005		
Department	Replaced by	
Institutionen för teknik och naturvetenskap		

Course offered for

- Master of Science in Media Technology and Engineering
- Master of Science in Electronics Design Engineering
- Master of Science in Communications, Transport and Infrastructure

Intended learning outcomes

The course shall give the student a positive start of the university studies, both in getting good relations with other students and in refreshing former mathematics. Further more some new mathematical concepts will be introduced. An important aim is to systematically give opportunities to improve some important skills by using various teaching procedures and several examination forms. This is aimed to improve the ability in reflecting about how the student herself /himself learns and in developing how to work with other students in a group, which shall be seen as a resource where good cooperation will be encouraged. After a completed course, the student should be able to:

- read and interpret mathematical text
- use calculation rules for real and complex numbers
- use basic properties for real functions such as domain and range, composite functions, inverses
- quote and use properties of elementary functions
- solve equations and inequalities
- quote and use properties for arithmetic and geometric sequences and sums and the binomial theorem
- explain and use the principle for mathematical induction
- use basic definitions and ideas in vector geometry and use equations for lines and planes, solve linear systems of equations
- quote some central definitions, theorems and carry out some proofs.

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, inverse trigonometric functions and complex exponential function. The Euler formulas. Basic principles of logic. Different types of proof techniques. Vectors and coordinate systems in the plane. Polar coordinates. Lines and circles. The complex plane. Complex numbers in polar form.

Teaching and working methods

Problem classes, tutorials, and a few lectures.

Examination

KTR1	Optional examinations	0 credits	D
UPG1	Assignments and oral presentations	1.5 credits	U, G
TEN1	Written examination	4.5 credits	U, 3, 4, 5

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.