Foundation Course in Mathematics

Programme course

6 credits

Matematisk grundkurs

TNIU19

Valid from: 2017 Spring semester

Determined by
Board of Studies for Mechanical Engineering and Design

Date determined
2017-01-25

Main field of study
Mathematics, Applied Mathematics

Course level
First cycle

Advancement level
G1X

Course offered for
- Civil Engineering, B Sc in Engineering

Entry requirements
Note: Admission requirements for non-programme students usually also include admission requirements for the programme and threshold requirements for progression within the programme, or corresponding.

Prerequisites
Upper secondary Mathematics courses A to D, or equivalent

Intended learning outcomes

The course aims to give students a positive start to their engineering university studies, they will experience a "social class" and also rehearse and develop their mathematical ability for future studies in Calculus I, Calculus II and applications in other courses. Some new mathematical concepts are introduced. An important goal is to develop learning by using different types of work and various forms of examination. This will contribute to improving students

- skills in writing, reading and speaking mathematical language, being able to present solutions of mathematical problems with clear thinking - both written with mathematical symbols, and in oral
- capacity for logical reasoning
- conceptualization and experience to perform the solution controls
- ability to reflect on their learning and giving familiarity with working in a group and where one should see the group as a resource where good cooperation encouraged

After the course the students will be

- able to demonstrate a basic ability to both write, read and speak the mathematical language
- able to show good algebraic numerate with real and complex numbers
- able to use the basic concepts of function theory, as defined quantity, value, quantity and inverse function
- elementary functions properties and use this in problem solving
- able to set up and solve equations and inequalities containing absolute values
- able to perform calculations using trigonometric functions

Course content

- Real numbers
- Factors, polynomial
- Equations and inequalities, containing rational expressions and absolute values
- Higher degree polynomial equations with real coefficients
- Functions and graphs
- Straight lines , quadratic functions, exponential and power functions and associated inverses
- Trigonometry and trigonometric functions
- Complex numbers and complex plane
- Euler's formula and the formula Moivres
- Polynomials of a complex variable and complex polynomial equations

The emphasis of the course is handling of algebraic expressions and properties of elementary functions. Solution of data must contain a clear logical way.

Teaching and working methods

The course consists of lectures, seminars and mentoring of teachers. Also mathematics mentors from higher grades are available for support. Sometimes class is divided into groups of about 4 students - in order to develop the oral mathematical language. Much of the work done in groupings.
course is taken during the period HT0 and HT1.

Examination

TEN2	Written examination	6 credits	U, 3, 4, 5
KTR6	Written Test	0 credits	U, G
KTR5	Written Test	0 credits	U, G
KTR4	Written Test	0 credits	U, G

The three approved KTR1-3 give the final grade 3. Written examination is required for higher grades.

Grades

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

Department

Institutionen för teknik och naturvetenskap

Director of Studies or equivalent

George Baravdish

Examiner

Peter Holgersson

Course website and other links

Education components

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

Course literature

Additional literature

Books

Forsling-Neymark, *Matematisk analys, en variabel*
ISBN: 9147051884

Compendia

Göran Forsling, Övningar i analys i en variabel

Common rules

Regulations (apply to LiU in its entirety)

The university is a government agency whose operations are regulated by legislation and ordinances, which include the Higher Education Act and the Higher Education Ordinance. In addition to legislation and ordinances, operations are subject to several policy documents. The Linköping University rule book collects currently valid decisions of a regulatory nature taken by the university board, the vice-chancellor and faculty/department boards.

LiU's rule book for education at first-cycle and second-cycle levels is available at http://styrdokument.liu.se/Regelsamling/Innehall/Utbildning_pa_grund-_och_avancerad_niva.