Calculus, one variable

Programme course

6 credits

Analys i en variabel

NMAA06

Valid from: 2017 Spring semester

Determined by

Board of Studies for Chemistry, Biology
and Biotechnology

Date determined

2017-01-25

Main field of study

Mathematics, Applied Mathematics

Course level

First cycle

Advancement level

G1X

Course offered for

- Chemistry - Molecular Design, Bachelor's Programme

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.

Intended learning outcomes

That you as a student will learn to feel confident with the mathematical expressions, reasoning and relations from Single Variable Calculus and that it will teach you calculating and problem solving skills needed for your further studies. After a completed course you should be able to:

- Read and interpret mathematical texts
- Explain definitions and expressions like local extremes, limits, continuity, derivatives, primitive functions and integrals
- Explain and use central theorems like The Fundamental Theorem of Calculus, Mean-Value Theorems, The Intermediate-Value Theorem and The Max-Min Theorem.
- Use mathematical laws for limits of functions and derivatives.
- Perform investigations of functions using derivatives, limits and the properties of basic functions and from this draw conclusions regarding the properties of the functions

Course content

- Preparatory course: Equations and systems of equations. Geometric and arithmetic sums. Inequalities. Binomial theorem. Exponential functions and logarithms. Polynomials. Trigonometry and trigonometric functions.
- Calculus: Real and complex numbers. Functions of a real variable. Elementary functions. Sequences, limits. Derivatives and continuity. Rules for differentiation. Properties of continuous functions. Study of functions.

Teaching and working methods

Teaching is done in lectures and problem classes.

Examination

KTR2	Written test	0 credits	U, 3, 4, 5
KTR1	Written test	0 credits	U, 3, 4, 5
TEN1	Written examination	6 credits	U, 3, 4, 5

Passed written test 1 and written test 2 gives a bonus on the written examination
(TEN1). The right to count the bonuses from the tests is 12 months from the date
of writing.

Grades

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

Other information

Supplentary courses: Mathematics, second course.

Department

Matematiska institutionen

Director of Studies or equivalent

Jesper Thorén

Examiner

Magnus Berggren

Course website and other links

http://www.mai.liu.se/kurser/

Education components

Preliminary scheduled hours: 118 h
Recommended self-study hours: 42 h

Course literature

Forsling, Göran och Neymark Mats: Matematisk analys, en variabel. Liber 2011.

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.