Calculus II

Programme course

6 credits

Analys II

TNA004

Valid from: 2017 Spring semester

Determined by
Board of Studies for Electrical
Engineering, Physics and Mathematics

Date determined
2017-01-25

Main field of study
Mathematics, Applied Mathematics

Course level
First cycle

Advancement level
G1X

Course offered for
- Electronics Design Engineering, M Sc in Engineering
- Communications, Transport and Infrastructure, M Sc in Engineering
- Media Technology and Engineering, M 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
Analysis I

Intended learning outcomes

To give basic proficiency in mathematical concepts, reasoning and relations contained in single-variable calculus. To provide the skills in calculus and problem solving required for subsequent studies. After a completed course, the student should be able to

- read and interpret mathematical text
- explain Taylors formula and the concepts series, power series and convergence of series.
- make comparisons metween sums and integrals
- use expressions for, and calculate, geometrical quantities such as plane areas, arc length, surface area, volumes of solids of revolution and areas of surfaces of revolution
- utilize ordinary differential equations (linear of first order: linear and separable and linear equations of higher order with constant coefficients, serie solutions) and integral equations
- use Taylors Theorem in approximating functions with polynomial, calculating limits and estimation errors and estimate local properties of functions.
- carry out convergence tests for improper integrals, series and power series and find derivatives and antiderivatives for power series
- carry out inspections of results and partial results, in order to verify that these are correct or reasonable.

Course content

Applications of integrals - Improper integrals: definition and calculations, area, length of curves, volume of solids of revolution, area of surfaces of revolution. Generalised integrals. Estimation of sums. The formulas of Taylor and Maclaurin. The Maclaurin expansion of elementary functions. Applications, e.g. estimation of errors and finding limits. Ordinary differential equations. Equations of the first order: linear and separable equations. Integral equations. Linear equations of higher order with constant coefficients. Serie solutions. Applications will be given of mathematical models from various fields. Series.

Teaching and working methods

Lectures and problem classes.

Examination

TEN1	Written exam	6 credits	U, 3, 4, 5

Grades

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

Department
Institutionen för teknik och naturvetenskap

Director of Studies or equivalent
George Baravdish

Examiner
Sixten Nilsson

Course website and other links
http://www2.itn.liu.se/utbildning/kurs/

Education components
Preliminary scheduled hours: 70 h
Recommended self-study hours: 90 h

Course literature
Forsling, G. och Neymark, N.: Matematisk analys, en variabel. Liber.
Problemsamling och kompletterande material utgivet av matematiska institutionen.

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.