



Faculty of Technology and Science
Mathematics

Syllabus

Course Approval

The syllabus was approved by the Faculty Board of Technology and Science on 29 May 2007, and is valid from the Autumn semester of 2007 at Karlstad University.

Course Code: MAGA46

Mathematics for Engineers II, 7.5 ECTS Credits
(Matematik för ingenjörer II, 7.5 Swedish credit points)

Degree Level: Bachelor

Progression Level: A

Language of Instruction

The language of instruction is Swedish.

Prerequisites

Mathematics for Engineers I, 7.5 ECTS, or the equivalent.

Major Field of Study

Mathematics

Aims

The aim of the course is that students acquire the basic mathematical knowledge and skills required for studies in the technological and science fields included in the engineering programme.

Upon completion of the course a student should be able to

- differentiate products, fractions, and compositions of the elementary functions.
- apply derivatives for graph constructions, extreme value problems, and related rates problems.
- use the Mean Value Theorem and Taylor's Formula to draw conclusions concerning the behavior of functions in the neighborhood of a given point.
- use partial integration, substitution of variables, and fractional decomposition to determine the primitive function of a given function.
- use integration calculus to compute areas, volumes, and other quantities in fields of application.
- use separation of variables and integrating factor to solve first order ODE:s.
- solve higher-order linear ODE:s with constant coefficients.
- use a numerical method for the solution of ODE:s.
- combine concepts, theorems, and experiences from examples, find analogies, make generalizations and simplifications.

- choose an appropriate model to solve problems in given situations within the areas mentioned above.

Course Content

Single-variable calculus: Differentiation of products, quotients and compositions of elementary functions. Applications, such as construction of curves, extreme value problems, and related rates. Mean Value Theorem and Taylor's Formula.

Primitive functions and integrals: Partial integration and variable substitution. Partial fractions. Applications, such as calculation of area and work.

Ordinary differential equations: Separation of variables, integrating factor. Linear ODE:s with constant coefficients. Some numerical method.

Reading List

See separate document.

Examination

Examination is in the form of a written exam. The number of examination opportunities for earning a Pss grade is limited to three per academic year.

Grades

One of the grades U (Fail), 3 (Pass), 4 (Pass not without distinction), or 5 (Pass with distinction) is awarded in the examination of the course.

Quality Assurance

Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course assessment is based on student views and experiences as reported in written course evaluations and/or group discussions. Students will be informed of the result of the evaluation and of the measures to be taken.

Course Certificate

A course certificate will be provided upon request.

Additional Information

Students who enrolled before 1 July 2007 will complete their studies in accordance with the requirements of the earlier admission. Upon completion students may request degree and course certificates to be issued under the current ordinance if they meet its requirements.

The local regulations for undergraduate studies at Karlstad University stipulate the obligations and rights of students and staff.