Reg No: FAK2 2007/11:6

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: MAGA47
Mathematics for Engineers III, 7.5 ECTS Credits
(Matematik för ingenjörer III, 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-II, 15 ECTS, or the equivalent.

Major Field of Study
Mathematics

Aims

The aim of the course is that students acquire the tools needed in the areas of transform theory, several variable calculus, probability, and statistics to study basic electrical engineering, control theory, and signal processing, and to prepare for further studies at advanced level.

Upon completion of the course a student should be able to:
- calculate the Fourier series of a periodic function and the Fourier transform of a function
- solve linear differential equations using the Laplace transform
- solve linear difference equations using the Z-transform
- localize max, min and saddle points to functions of two variables
- solve easy problems within quality control and communication theory by means of basic knowledge in statistics and probability theory
- use the most commonly appearing probability distributions to solve applied problems

Course Content

Transform theory: The Laplace transform and ordinary differential equations. The Z-transform and difference equations. Fourier series of periodic functions. The complex form of the Fourier transform.

Several variable calculus: Partial differentiation and easy partial differential equations. The equation of the tangent plane in a point to a surface, the Taylor polynomial of second order, extreme value problems and the method of least squares.

Probability and Statistics: probabilities and set theory, independent events, density functions, expectation, variance, common discrete and continuous distributions.

Reading List

See separate document.

Examination

Examination is in the form of a written exam. The number of examination opportunities for earning a Pass 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.

Karlstads universitet 651 88 Karlstad, Sweden
Tel +46-54-700 10 00 Fax +46-54-700 14 60
information@kau.se www.kau.se