



Faculty of Technology and Science
Mathematics

Syllabus

Course Approval

The syllabus was approved by the Faculty Board of Technology and Science on 28 April 2009, and is valid from the Autumn semester of 2009 at Karlstad University.

Course Code: MAAD08

Functional Analysis, 7.5 ECTS Credits

(Funktionalanalys, 7.5 Swedish credit points)

Degree Level: Master

Progressive Specialisation: A1N (Second cycle, has only first-cycle course/s as entry requirements)

Language of Instruction

Swedish or English

Prerequisites

Mathematics 75 ECTS credits (out of 1-90 ECTS credits) including Linear Algebra 7.5 ECTS cr, Introduction to Analysis 7.5 ECTS cr, Complex Analysis 7.5 ECTS cr, or equivalent.

Major Field of Study

MAA (Mathematics)

Learning Outcomes

Upon completion of the course, students should be able to:

- verify axioms and determine the completeness of metric space and normed space,
- determine boundedness and compactness of linear operators,
- determine the norms of certain types of bounded linear operators,
- apply the reasonings and techniques used in proving theorems to solve problems,
- prove and apply a given sample of the central theorems covered in the course,
- demonstrate understanding by combining the use of concepts, theorems and experiences from examples, by seeing analogies and by making generalisations.

Content and Form of Instruction

Instruction is in the form of lectures and exercises.

The course includes the following components:

- metric space
- linear normed space
- Hilbert space
- linear functionals
- bounded linear operators
- the main principles for Banach spaces
- dual space and weak convergence
- adjoint operators

- compact operators

Reading List

See separate document.

Examination

Examination is in the form of a written exam.

The number of examination opportunities is limited to three per academic year.

Grades

One of the grades Fail (U), Pass (G), or Distinction (VG) 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 studies at the Bachelor's and Master's levels 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