Linnæus University

Course syllabus

Faculty Board of Science and Engineering
School of Computer Science, Physics and Mathematics

4MA115 Funktionalanalys, 7,5 högskolepoäng
Functional Analysis, 7.5 credits

Main field of study
Mathematics

Subject Group
Mathematics

Level of classification
Second Level

Progression
A1N

Date of Ratification
Approved by the Board of the School of Computer Science, Physics and Mathematics 2009-08-11

Revised 2012-08-17. Prerequisites are revised.

The course syllabus is valid from spring semester 2013

Prerequisites
4MA113 Topology 7.5 credits and 4MA111 Integration Theory 7.5 credits or equivqlent.

Objectives
The student should be able to

- operate with various metrics and topologies
- use metric spaces and especially Banach spaces and Hilbert spaces for solution of problems
- operate with definitions and central notions of the course in coupling with study of various problems
- operate, communicate and present argumentation using mathematical forms of representation
- be able to prove three basic theorems of functional analysis; Hahn-Banach, Banach-Steinhaus and Banachs theorem about open operator
- work with continuous linear operators in Banach spaces and Hilbert spaces
- show applications to differential equations
- give various examples of continuous linear operators in Banach spaces

Content
The course content is

- metric, normed and especially Banach spaces and Hilbert spaces
- theory of continuous linear operators

Type of Instruction
Lectures and seminars. Compulsory assignments may be given during the course

Examination
The course is assessed with the grades Fail (U), Pass (G) or Pass with Distinction (VG).
The student's knowledge is assessed in the form of oral and/or written examination.

On request, students may have their credits translated to ECTS-marks. Such a request must be sent to the examiner before the grading process starts.

Course Evaluation
After the course a written evaluation of the course will take place according to the University guidelines.

Required Reading and Additional Study Material

Fomin S. V. och Kolmogorov A. N.*Introductory Real Analysis*, Dover Publication, INC, New York. 403 pages.