Linnæus University

Jnr: 2016/3628-3.1.2.2

Course syllabus

Faculty of Technology
Department of Mathematics

4MA415 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 2014-10-03
Revised 2016-06-15 by Faculty of Technology.
The course syllabus is valid from autumn semester 2016

Prerequisites
60 credits mathematics and 1MA453 Vector analysis 7.5 credits or equivalent.

Objectives
After completing the course, the student should be able to

- independently and with adequate techniques solve problems, perform calculations, and conduct lines of reasoning within the part of mathematics that is covered by the course, and to clearly communicate these solutions, calculations, and reasonings in writing
- describe terminology and definitions, along with formulating, proving and analyzing theorems that are central to the course.

Content
Nowhere dense sets, Baire's theorem for complete metric spaces, topological vector spaces, locally convex spaces, dual spaces, Hahn-Banach's Theorem, weak topologies, Banach's theorem about inverse operators, other criteria of invertability, spectral theory of operators in Banach and Hilbert spaces, adjoint operators, self-adjoint operators in Hilbert spaces, Spectral theorem for bounded and unbouded operators in Hilbert spaces.

Type of Instruction
Lectures and seminars.

Examination
The course is assessed with the grades A, B, C, D, E, Fx or F.
The grade A constitutes the highest grade on the scale and the remaining grades follow

in descending order where the grade E is the lowest grade on the scale that will result in a pass. The grade F means that the student's performance is assessed as fail (i.e. received the grade F).

The student's knowledge is assessed in the form of a written exam.

Course Evaluation

During the course or in close connection to the course, a course evaluation is to be carried out. The result and analysis of the course evaluation are to be communicated to the students who have taken the course and to the students who are to participate in the course the next time it is offered. The course evaluation is carried out anonymously. The compiled report will be filed at the Faculty.

Credit Overlap

The course cannot be included in a degree along with the following course/courses of which the content fully, or partly, corresponds to the content of this course:4MA115 Functional analysis, 7.5 credits

Other

Grade criteria for the A–F scale are communicated to the student through a special document. The student is to be informed about the grade criteria for the course by the start of the course at the latest.

Required Reading and Additional Study Material

Reed M. & Simon B. "Methods of Modern Mathematical Physics I. Functional Analysis", Academic Press, New York, latest edition, 400 pages.