MAF620, C2 Functional Analysis, 5p
Course Information, Spring 2005

Literature

[**GF**] G. Folland: Real Analysis. Modern Techniques and their Applications, John Wiley & Sons, 1999, Chapters 5–7 and parts of Chapter 4.

Description of the course

The basic idea of functional analysis is to apply geometric methods to functions and function spaces. A function is considered as a point in a space, and this space will be a vector space of infinite dimension. Geometric objects like balls, and also convergence, are introduced in these spaces.
The course will consist of lecture and exercise sessions. The exercises will be taken from Folland's book and from sheets handed out during the course.

Prerequisites

Basic linear algebra, basic analysis in one and several dimensions, integration theory with Lebesgue measure and general measures.

Rough plan of the course

The numbers refer to chapters and section in Folland.
5.1 normed linear spaces
6.1,2 L^p spaces and their duals
5.2 the Hahn-Banach theorem
5.3 Baire's theorem with consequences
5.5 Hilbert spaces
from 5.4 the separable case of Alaoglu's theorem
from Chap. 4 topological spaces, Hausdorff spaces, compactness, Tychonov's theorem
5.4 topological vector spaces, weak topologies, the general case of Alaoglu's theorem
from Chap. 4 Urysohn's lemma in locally compact Hausdorff spaces
7.1,2 the Riesz representation theorem, positive case

7.3 idem, signed case
6.3,4,5 More on L^p spaces, interpolation

Lecturer/Examinator

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Course website

http://www.math.chalmers.se/Math/Grundutb/GU/MAF620/
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