Functional Analysis 1

Course Syllabus

Spring Term 2011 — SNU

Course Title	Functional Analysis 1 (in English)
Course number	3341.603
Instructor	Gerald Trutnau
E–Mail	trutnau@snu.ac.kr
Course homepage	`http://www.math.snu.ac.kr/~trutnau/teachingFA1-2011.html`
Course Objective	We will study the main basic theorems and principles of functional analysis together with corresponding applications, in particular we cover: metric spaces, semi-norms, completeness, Banach and Hilbert spaces, function spaces, Sobolev spaces, separability, Stone-Weierstrass theorems, partition of unity, compactness, Arzela-Ascoli, Linear operators, Neumann series, Distributions, Linear functionals, Hahn-Banach theorems, Lax-Milgram theorem, dual space, weak convergence, reflexivity, Baire category theorem, Banach-Steinhaus, oppen mapping theorem, closed graph theorem, projections, orthogonality.
References	Here are some recommended references: - Alt, Hans Wilhelm: Lineare Funktionalanalysis, Springer (unfortunately in German); 5th edition (2006), available as ebook at the central library - Brézis, Haïm: Analyse fonctionnelle, Dunod (2002), and its new expanded English Edition: Functional Analysis, Sobolev Spaces and Partial Differential Equations, Springer; (2010) - Lax, Peter D.: Functional Analysis, Wiley-Interscience (2002) - Rudin, Walter: Functional Analysis, McGraw-Hill, 2 edition (1991) - Yoshida, Kôsaku: Functional Analysis (Springer Classics in Mathematics) (6th edition, 1980)

Evaluation - Attendance: (will not be checked). However, students are supposed to know the material taught in class.

- Take Home Exam I (7-9th week, 40 % of final score);

- Take Home Exam II (13-15th week, 40 % of final score);

- Other: (20 % of final score)