

MBY0022

**METHODS OF FUNCTIONAL ANALYSIS**  
SPRING 2012/13

INSTRUCTOR: Mert Çağlar, İstanbul Kültür University

TIMETABLE: Thursday 14:00–17:00 (İKÜ, 3C-17)

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ASSESSMENT: One mid-term and one final examination, and several homework assignments will be given during the semester. The letter grade of the student will be determined upon considering the exams and the homeworks along with student's participation to the course.

PRE-REQUISITIES: Acquaintance with the basics of Linear Algebra, General Topology, and Real Analysis.

PRINCIPAL TEXTBOOK: M. Fabian, P. Habala, P. Hájek, V. Montesinos & V. Zizler, *Banach Space Theory: The Basis for Linear and Nonlinear Analysis*, CMS Books in Mathematics, Springer, New York, 2011.

PROGRAMME

WEEKS	SUBJECTS TO BE COVERED
1 & 2	Basic concepts and classical spaces
3 & 4	Operators, quotients, finite-dimensional spaces
5 & 6	Hilbert spaces
7 & 8	Hahn-Banach Extension and Separation Theorems, Duals of classical spaces
<b>Will be announced</b>	<b>Mid-term Exam</b>
9 & 10	Open Mapping and Closed Graph Theorems, Dual operators
11 & 12	Weak topologies and Banach spaces
13 & 14	Compact operators on Banach spaces
<b>Will be announced</b>	<b>Final Examination</b>

SUGGESTED READING:

- Y.A. Abramovich & C.D. Aliprantis, *An Invitation to Operator Theory*, Graduate Studies in Mathematics, Vol. 50, American Mathematical Society, Providence, RI, 2002.
- B. Bollobás, *Linear Analysis: An Introductory Course*, 2n ed., Cambridge Mathematical Textbooks, Cambridge University Press, Cambridge, 1999.
- A. Brown & C. Pearcy, *Introduction to Operator Theory I: Elements of Functional Analysis*, Springer-Verlag, New York, 1977.
- John B. Conway, *A Course in Functional Analysis*, 2nd ed., Springer-Verlag, New York, 1990.
- N. Dunford & Jacob T. Schwartz, *Linear Operators. Part I: General Theory*, Fourth printing, Interscience Publishers, Inc., New York, 1967.
- Y. Eidelman, V. Milman & A. Tzolomitis, *Functional Analysis: An Introduction*, Graduate Studies in Mathematics, Vol. 66, American Mathematical Society, Providence, RI, 2004.
- M. Fabian, P. Habala, P. Hájek, V. Montesinos Santalucía, J. Pelant & V. Zizler, *Functional Analysis and Infinite-dimensional Geometry*, CMS Books in Mathematics, Springer-Verlag, New York, 2001.
- L.V. Kantorovič and G.P. Akilov, *Functional Analysis*, Translated by Howard L. Silcock, 2nd ed., Pergamon Press, Oxford, New York, 1982.
- Barbara D. MacCluer, *Elementary Functional Analysis*, Springer, New York, 2009.
- R. Meise & D. Vogt, *Introduction to Functional Analysis*, Translated by M.S. Ramanujan, Clarendon Press, Oxford, 1997.
- W. Rudin, *Functional Analysis*, McGraw-Hill Book Co., New York, 1973.
- M. Schechter, *Principles of Functional Analysis*, 2nd ed., Graduate Studies in Mathematics, Vol. 36, American Mathematical Society, Providence, RI, 2002.