DEPARTMENT OF MATHEMATICS,

UNIVERSITY OF KARACHI,

Course Outline

MATH 611: FUNCTIONAL ANALYSIS - I

Course contents:

Metric spaces. Euclidean and Unitary spaces. Complete, compact and separable metric spaces. Sets of first and second category. Bires category theorem Equicontinuity. Arzolla's theorem. Normed vector spaces and Banach spaces. Bounded linear transformations and functionals, Dual spaces, Hahn-Banach theorem, Uniform boundedness. Banach-Steinhaus theorem. Open Mapping and closed graph theorems and their applications. The dual of normed spaces, Adjoints.

Books Recommended:

1. Kreyszig, E., Introductory functional analysis with applications John Wiley and Sons, 1978.
2. Nachbin, L., Introduction to Functional Analysis: Branch Space and Differential Calculus, Marcel Dekker. Inc.1981.
3. Davis, E. B., Spectral Theory and Differential Operators, Cambridge University Press, 1995.
4. Limaye, B.V., Functional Analysis, Wiley Eastern Limited, 1980.
5. Devito, C. L., Functional Analysis and Linear Operator Theory, Addison Wesley Publishing CO., 1990.
6. Siddiqui, A. H., Functional Analysis with applications, Tata McGraw Hill, 1986.
7. Vulik, B. Z, Introduction to Functional Analysis, Pergamon, 1963.
8. Simmons, G. F., Introduction to Topology and Modern Analysis, McGraw Hill, 1998.
9. Goffman, C. and Pedrick, G., First Course in Functional Analysis, Prentice Hall, 1997.
10. Taylor, A. E., Introduction to Functional Analysis, Prentice Hall, 1979.
11. Somasundaram, D., A First Course in Functional Analysis, First Edition, Narosa Publishing House, New Delhi, 2006.