DEPARTMENT OF MATHEMATICS,

UNIVERSITY OF KARACHI,

Course Outline

MATH 501: ANALYSIS - I

Course contents:

Algebra of sets; Partition and Equivalent classes, partially ordered sets and Axiom of Choice. Canonical decomposition of functions. Euclidean metric spaces (n ≥1). Convergence of sequences. Completeness. Functions of several real variables; their continuity and differentiability. Implicit and Inverse function Theorems. Taylor's Theorem. Jacobians and functional dependence. Taylor's Theorem (several variables). Maxima, Minima; Legrange's method of undermined multipliers. Riemann and Riemann-Stieltijes integrals. Differentiation under integral sign.

Books Recommended:

1. Apostol, T. M., Mathematical Analysis, Addison Wesley, 1978.
2. Kaplan, W., Advanced Calculus, Addison Wesley, 1965.
3. Rudin, W., Principles of Mathematical Analysis, Mc Graw Hill, 1976.
4. Taylor, A. E. and Mann, W. R., Advanced Calculus, C/M Wiley, New York, 1983.

5. Churchil, R. V., Complex Variables and Applications, Mc Graw Hill, 2005.

6. Paliouras, F. B., Complex Variables, Collier McMillan, New York, 1975.

7. Pennesi, L. L., Elements of Complex Variables, Holt, Rinechart and Winston, New York, 1967.

8. Mathews, J. H., and Howell, R. W., Complex Analysis for Mathematics and Engineering, Fifth Edition, Jones and Bartlett Publishers, Boston, 2006

9. Jeffrey, A., Complex Analysis and Application, Second Edition, Chapman and Hall/CRC, New York, 2006

10. Sharma, S. C., Complex Integration, First Edition, Discovery Publishing House, New Delhi, 2007.