

**AM-811 (Paper I): Research Methodology
(M Phil /PhD)**

UNIT 1: General Introduction and Motivation

Importance of research and different aspects related to it, plagiarism and its prevention, government policies on higher education and thrust areas, selection of topic of research, various sources for survey of research material, scientific journals in different mathematical subjects, type of journals, impact factor of a journal its importance, citations of an author and research papers, funding agencies for scientific and mathematical research projects, paper writing skills, knowledge of LaTeX, copy rights and ethics of research

UNIT 2: Essential Mathematical Analysis

Convergence of sequences and series, improper integrals, topological vector spaces, normed spaces, Banach spaces, Hilbert spaces

UNIT 3: Numerical Methods and Computational Skills in MatLab / Mathematica

Accuracy and stability in numerical computing, problem-solving in MatLab / Mathematica, numerical solution of simultaneous linear algebraic equations, solution of nonlinear equations, solution of initial value problems, solution of boundary value problems, partial differential equations.

UNIT 4: Statistical Skills

Random variables and distributions: binomial, normal and Poisson, the statistical estimation theory, statistical decision theory, the Chi-Square test, correlation theory

BOS dated 26.12.2013

Paper II: Specialized Paper

The course contents will be framed for each candidate by the supervisor comprising review of published work in his /her field and other topics prescribed by the Board of Studies of the Department.