

DEPARTMENT OF GEOLOGY

UNIVERSITY OF DELHI

DELHI-110007

Ph.D. in Geology

Courses of Teaching (New admissions)

Syllabus for course work (M.Phil. and Ph.D.) Paper I

Research Methods

Meaning and objective of research, significance, types (descriptive, analytical, qualitative, quantitative, empirical, conceptual, fundamental) of research, hypothesis forming and testing, ethical guide for academic research. Plagiarism and its prevention.

Geoscientific methods- (From) X-ray diffraction, Reciprocal lattice, Ewald's Sphere, Crystal field theory. Raman and Mossbauer spectroscopy, Microbeam techniques- SEM, EPMA, Atomic Force Microscope, electron beam-matter interaction, secondary and back-scattered electrons, auger electrons, energy transitions and characteristic x-rays, EDS & WDS, data generation, detection limits, matrix correction and data reduction X-ray fluorescence and induced couple plasma (ICP) analysis- principles and instrumentation (TA), Total organic carbon analyzer, TL/OSL dating techniques, Fluid inclusion and analog and digital modeling

Basic Statistics- measures of central tendency, dispersion and asymmetry, simple and multiple correlation and regression,

Sample and type of samples, sampling theory, standard error and error analyses.

Multivariate Analysis: Multivariate data in Geological studies, principal component analysis.

Factor analysis, Discriminant function Analysis, c,

cluster Analysis, Hotelling m^2 statistics.

Numerical Analysis: Definition, solution of non-linear and linear equations.


Programming language, program development process, Development goals, system design, language selection, implementation, program design, debugging. Concepts of Data Base Management Systems.

Demonstration of software package with processing of geological data, such as

- (i) Statistical analysis of orientation data
- (ii) Numerical solution of non-linear equations
- (iii) Data base management of geological data using ASE package.

Course II: COURSE RELATED TO TOPIC OF DISSERTATION

Students are expected to submit written assignments under the guidance of concerned supervisor(s). This course will aim to give the students comprehensive knowledge of the literature in the subject and future problems to resolve.


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