**Ph.D. Course Work (Session 2020-21)**

**Paper III Advacnced Studies in Earth Science (Geology/Remote Sensing)**

**Subject : Earth Science (Geology/Remote Sensing)**

- Concept of maps and scale . Survey of India topographic maps and their interpretation; Contours and their interpretation
- Concept of dip, strike bearing and plunge; Geological mapping and field equipments
- Methods of primary and secondary data collection
- Basic concept of physical and chemical analysis of geological samples.
- Ground water exploration: Methods of Geological and Geophysical prospecting of ground water.
- Groundwater development and management
- Measurement of surface run off; infiltration and evaporation of running water and underground water.
- Methods of chemical analysis of water samples
- Concept of watershed and their management ; conservation of mineral resources
- Geo-environmental baseline data; Impact of mining activities on environment.
- EIA and EMP
- Drainage Mapping and morphometric analysis; Land use land cover mapping
- Natural hazards : Risk assessment analysis; Strategies for hazard mitigation
- Remote Sensing for geological investigation. Remote Sensing data products. Methods of interpretation of aerial photographs and satellite images.
- Digital images. Digital image processing ; Image processing and GIS softwares
- Geographic Information system : Data structure of GIS, Raster and vector data
- Application of GIS in various fields of geology
- Fundamentals of GPS and its use in mapping
- Digital elevation model and its application in geomorphology and water resources studies.
- Use of Remote Sensing and GIS in the preparation of hazard-zonation maps.

**Recommended Books:**


Pettijohn, F. J.: Sedimentary rocks

Reneick and Singh: Depositional Sedimentary environments

Marshak, S., and Mitra, G.: Basic Methods of Structural geology

Lahee: Field Geology

Thurnbury, W. D.: Principles of Geomorphology

Mathur, S. M.; Geomorphology of India

Bateman, A. M.: Economic mineral deposits

Banerjee, D. K. : Mineral resources of India

Gokhle, K. V. G. K. and Rao, :Ore deposits of India

Krishnaswamy, S., Mineral resources of India

Garg, S. P.: Ground water and Tube wells

Karanth, K. R.: Hydrogeology

Raghunath, H.M., , Ground Water, New Age International Publishers,New Delhi.

Walston, W. C.,: Ground water resource evaluation

Todd, D. K.: Ground water Hydrology

Valdiya, K. S.,: Environmental Geology- Indian Context

Coates, D. R. , : Environmental Geology

Keller, E. A.,: Environmental Geology

Anji Reddy, M., : Remote sensing and Geographic Information System

B. C. Panda: Remote sensing principles and application

Campbell, J. B.: - Principles of Geographical Information System

Jenson, J. R., : Introductory digital Image Processing

Jenson, J. R. Remote Sensing of environment

Lillesand, T. M., Keifer, R. W., Chipman, J. W.,:, Remote sensing and Image interpretation