

6TH SEMESTER

DISCIPLINE SPECIFIC ELECTIVE (DSES)

OPTION-I

GL616DA: GEOLOGY: PALEONTOLOGY AND STRATIGRAPHY

CREDITS: THEORY-4, PRACTICAL-2

UNIT-1:

Paleontology: Origin and evolution of the life through ages; Geological time scale; Preliminary idea about faunal succession. Fossils, their characters, conditions necessary for fossilization; types of preservation and occurrence. Application of Paleontology. Evolution of Man, Horse & Elephant

Unit-2:

Morphology characters, geological, geographical and stratigraphic distribution of the following: (1) Brachiopoda (2) Bivalvia (3) Gastropoda (4) Cephalopoda (5) Graptoloida (6) Anthozoa (7) Echinoidlea (8) Trilobita

Introduction to micropaleontology and microfossils and their application.

UNIT-3:

Elementary ideas about Foraminifera, Ostracoda, Radiolarian and Conodonts.

Elementary concept of vertebrate Paleontology with special reference to Siwaliks. Introduction to Palaeobotany with special reference to Gondwana plant fossils.

Extinction of organisms with special reference different hypothesis for the extinction of dinosaurs. Introduction to Palynology and its applications. Application of Paleontological data in paleogeographic reconstructions. Paleontological evidence in favor of continental drift.

UNIT-4:

Stratigraphy: introduction, nomenclature and Principles. Stratigraphic correlation; imperfection of Geological record. Brief introduction to Precambrian rocks of India with special reference to their classification, distribution, lithology and economic importance: Dharwar, Aravalli, Cuddapah, Vindhyan and J&K.

Stratigraphy of the following Phanerozoic rocks with special reference to their lithology and fossil Content Paleozoic succession of Kashmir. Triassic of Spiti, Jurassic of Kuch, Cretaceous of Tiruchirapalli. Stratigraphy of Siwaliks and Karewas of Kashmir.

Practical

credits-2

Study of morphological characters of the selected genera-Brachiopoda, Bivalvia, Gastropoda, Cephalopoda, Trilobita, Echinoidea Graptoloida and Anthozoa.

Suggested readings:

Condie, K. C., 1997: Plate Tectonics and Crustal Evolution, Butterworth & Heimnemann.

Keary, P. and Vine, F. J. 2000: Global Tectonics, Blackwell Science.

Cox, A., 1996: Plate Tectonics. Blackwell Science.

Meyerhoff, et al. 1996: Surge Tectonics, Kluwer Academics.

Bell, F.G., 1998 Environmental Geology, Blackwell.

Bell, F.G., 1999: Geological Hazards, Routledge, London.

Subramanian, V., 2001: Text Book on Environmental Science, Narosa International.

DISCIPLINE SPECIFIC ELECTIVE (DSES)

OPTION-II

GL616DB: GEOLOGY: REMOTE SENSING AND SOCIETAL GEOLOGY

CREDITS: THEORY-4, PRACTICAL-2

UNIT-1:

Remote sensing concept and foundation of RS (Electromagnetic spectrum, radiation laws). Overview Of RS technology. Landsat, IRS, SPOT, MODIS. Introduction to Microwave remote sensing and its Applications.

Interaction of Electromagnetic waves with Earth surface features (water, soil, rocks, and vegetation). Photo-geology and its applications. Spectral behaviour of different soils. Mapping of soil - eroded and non eroded soil and degraded lands.

Application of remote sensing: geomorphological mapping, geological hazards assessment, hydrology And land use/land over mapping.

Unit-2

Introduction to GIS and its applications. Digital terrain analysis using DEM data: Path analysis, Network applications and morphometry; Introduction to GIS models and modelling. Fundamental concept (environment, population needs and planning).

Mineral resources vis-a-vis population needs; environmental impact of exploration and processing of mineral resources on air, soil and surface and subsurface water. Water supply and water use - human, agriculture and industrial.

Societal implications of major hydroelectric, nuclear and industrial projects.

Unit-3

Societal Geology: Fundamental concept (environment, population needs and planning). Natural Hazards: Earthquakes; scale of intensity related damage, preventive measures. Seismic hazard Zonation.

Landslides: slope stability, causes of landslides, anthropogenic activity and landslide, prevention and correction of landslides. Landslide hazard mapping using RS

Flood: magnitude and frequency of floods, urbanization and flooding, nature and extent of flood hazard.

Coastal hazards: tropical cyclones, tsunamis and coastal erosion

Unit-4

Hydro-geomorphic mapping of the terrain using different images of different satellite missions.

Lineament mapping. Subsurface geophysical methods- electrical resistivity, seismic, gravity etc. Well logging for delineation of aquifers and estimation of water quality. Application of Remote Sensing data in detection of soil moisture and shallow aquifers. Shallow groundwater potential zone mapping using satellite Images.

Remote-sensing and GIS applications in real time disaster monitoring, prevention and rehabilitation.

PRACTICAL

CREDITS-2

Tutorial on different modules of image processing software; Import and export of satellite data;

Different image and remote sensing data formats; Familiarization with the earth surface features on the images; Pre-processing of satellite data like image registration, geo-correction, filtering. Image enhancements; image ratios and its uses, land use/land cover feature identification.

6TH SEMESTER

DISCIPLINE SPECIFIC ELECTIVE (DSES)

OPTION-III

GL616DC: GEOLOGY: PROJECT WORK/DISSERTATION

CREDITS: THEORY+PRACTICAL=6

Students will need to carry out project/dissertation work in the 6th semester. The area of Dissertation shall be assigned to the students as per the supervisor(s) and expertise available in the Department. The students may be given projects on a variety of topics, requiring field and lab work, related to their core and discipline specific electives. Preferably, they should be given minor projects to be completed within the semester in consultation/supervision of teachers of the discipline. The students will be required to submit the brief Project Dissertation by the end of 6th Semester.