

Department of Geology

Master of Science

Program Outcome

PO1: Students will develop disciplinary knowledge and concept of earth science.

PO2: Students will acquire communication skills, presentation of ideas, critical thinking and analytical reasoning with scientific approach.

PO3: Project work has been introduced to encourage the development of the problem solving ability.

PO4: Students will acquire a sense of reasoning and inquiry. To synthesise, articulate and interpret conclusions from data and experiments.

PO5: Compulsory field training program help the students to develop the skill of working in a group.

PO6: Ability to work independently, identify appropriate resources required for a project, and manage a project through to completion.

PO7: Students will be equipped with Geological knowledge to be employed in different organizations.

Program Specific Outcome

PSO1: The course's specific aim is to acquaint students on principles of crystallography and mineralogy and leads to gain knowledge of composition of rocks and the earth's composition.

PSO2: To know about the processes that creates different landforms.

PSO3: Understand rock and lithospheric deformation histories and remodel the nature of their forces.

PSO4: Learn the principal types of rocks and to predict the suites of rocks found in different plate tectonic settings.

PSO5: Understand the age and significance of depositional sequences and decipher the geological history of an area from fossil assemblages.

PSO6: Identifying the economic minerals and learn their origin, composition and occurrence.

PSO7: Learn prospecting, exploration and mining methods of economic minerals.

PSO8: Understand the techniques of evaluations, impact of human development on environment systems.

PSO9: Application of geological knowledge in construction of engineering structures.

PSO10: Learn the role and impact of atmosphere and ocean circulation in climate and weather change.

PSO11: Application of photo-geology and remote sensing in the study of geologic features

PSO12: Students will learn geological factors governing the occurrence of groundwater and their management.

Course Outcome

M. Sc 1

Course: Mineralogy, Crystallography and Analytical Technique

CO1: Learning the aspects of bonding forces in crystal symmetry and crystal structure and understanding systematic mineralogy.

CO2: Studying systematic description of rock forming silicates.

CO3: Learning various analytical and imaging methods in mineral science.

CO4: Learn about the structure and the optical properties of crystals.

Course: Structural Geology and Geodynamics

CO1: Understand the concepts of stress and strain and learn their impact on the earth's crust.

CO2: Be able to differentiate between the types of stress and strain

CO3: Develop skills in identification of hand specimens of deformed structures

CO4: Develop skills in preparation and interpretation of geological maps and sections.

CO5: Able to record, plot field data and develop skills in field mapping.

CO6: Understand in full the mechanics of folding, various causes and dynamics of faulting

CO7: Understand in detail the proper concept of planar and linear fabrics in deformed rocks

CO8: Learn about seismic behaviour in earth's interior

CO9: Learn about continental drift and its evidences

CO10: Learn about the motion and mechanism of tectonic plates and the associated features.

CO11: Understand the geodynamic evolution of Indian cratons and Himalaya

Course: Sedimentology

CO1: Importance of role of weathering in the formation of rocks and soil- one of the planet's most important natural resources.

CO2: Importance of primary, secondary and organic sedimentary structures in understanding the past environment.

CO3: Understanding the importance of facies analysis in the exploitation of earth resources.

CO4: Develop required skills for analytical works in the laboratory

CO5: Understanding the impact of tectonics on sedimentation and basin analysis.

CO6: Studying various sediment types deposited in different environments.

Course: Igneous and Metamorphic Petrology

CO1: Understand the generation of Magma and the subsequent solidification to different Igneous Rocks.

CO2: Petrology and petrogenesis of Major Igneous rock types.

CO3: Understand the concept of metamorphic mineral assemblages, reactions and metamorphic zones.

CO4: Understand facies concept and Geothermobarometry of metamorphic minerals

Course: Sedimentology

CO1: Importance of role of weathering in the formation of rocks and soil- one of the planet's most important natural resources.

CO2: Importance of primary, secondary and organic sedimentary structures in understanding the past environment.

CO3: Understanding the importance of facies analysis in the exploitation of earth resources.

CO4: Develop required skills for analytical works in the laboratory

M.Sc 2

Course: Palaeontology

CO1: Studying Origin of life and mechanism of evolution.

- CO2: Recognition and identification of fossil groups and classes
- CO3: Study of morphological features, systematic classification and stratigraphic age of important Fossil Assemblages.
- CO4: Learning how to sample and process microfossils and study of morphology of foraminiferas and ostracods and its applications.
- CO5: Morphology, classification and application of pollen and spores, calcareous nannofossils, etc.

Course: Stratigraphy and Quaternary Geology

- CO1: Understanding the importance of stratigraphy as mother branch of geology.
- CO2: Develop skills for litho- bio- and chrono correlation
- CO3: Develop the concept of dynamic stratigraphy
- CO4: Provide foundation in basic principles of sedimentology, stratigraphy and related sciences.
- CO5: Develop insight into innovative applications of principles of stratigraphy and related sciences to areas of study such as environmental analysis, palaeo climate evaluation, groundwater resources, and marine pollution.
- CO6: Develop skills to evaluate and interpret data and concepts related to palaeoclimatology, Earth surface processes, and the history of global change in the Quaternary Period.
- CO7: Students should be able to collect, analyze and synthesize field and laboratory data related to Earth surface materials and landforms.

Course: Mineral Exploration and Mining Geology

- CO1: Concept of prospecting and exploration methods includes mapping, sampling and drilling methods.
- CO2: Understand the principles of seismic waves and its application in exploration
- CO3: Introduction to various geophysical methods of exploration
- CO4: Understanding basic principles of geochemical exploration methods
- CO5: Learning the different methods of open and underground mining.

Course: Geomorphology and Oceanography

- CO1: Understand in detail the early concept and perception of landscape development processes
- CO2: Idea on the various morphometric parameters of basin analysis
- CO3: Understand the role and importance of geomorphology in field geology
- CO4: Learn about marine environment and its communities
- CO5: Learn about ocean circulation

M.Sc 3

Course: Engineering Geology and Hydrogeology

- CO1: Understand soil behaviour and its characteristics
- CO2: Understand the engineering properties of rocks and its application in constructions.
- CO3: Analysing the impact of engineering projects on environment
- CO4: Study the causes of landslides and slope instability
- CO5: Studying the types of water and understanding rock properties affecting groundwater.
- CO6: Understanding hydro mechanical properties and various methods used to explore water.
- CO7: Learning best uses of water. Understanding contamination and pollution control.

Course: Economic and Ore Geology

- CO1: Provide knowledge about genetic processes of ore minerals.

- CO2: Understanding geographical distribution of ore deposits
- CO3: Understanding magmatic concentration processes and resultant deposits.
- CO4: Understand the process of formation and occurrence of ore minerals
- CO5: Describe the optical and physical properties of ore minerals

Course: Fuel Geology and Geochemistry

- CO1: Understand different methods of Chemical analysis of Coal.
- CO2: Macroscopic and microscopic constituents of Coal.
- CO3: Fundamentals of CBM exploration and production and estimation of coal reserves.
- CO4: Understand the origin and the properties of elements.
- CO5: Idea of geochemical classification of elements by Goldschmidt
- CO6: Understand radiogenic isotopes and radiometric dating using various decay schemes
- CO7: General idea about stable isotopes
- CO8: Understanding the mechanism of transformation of organic matter into kerogens and its migration.
- CO9: Learning the types of reservoir rocks and different oil basins in India. Atomic fuels.

Course: Geology of Northeast India

- CO1: Learning the complex geology of Nagaland and Manipur
- CO2: Understanding the stratigraphy, tectonics and mineral resources of Assam
- CO3: Learning the Geological complexity of Meghalaya in relation to its lithology and tectonism
- CO4: Study the Himalayan geology and its formations in Arunachal Pradesh
- CO5: Understand the Geology of hilly states of Mizoram and Tripura

M.Sc 4

Course: Environmental Geology and Climatology

- CO1: Study of degradation and contamination of surface and groundwater due to industrialization and urbanisation. Deforestation and soil quality degradation.
- CO2: study of solid, liquid and radioactive waste its management and alternative energy resources.
- CO3: Understanding earthquake and volcanism, Influence of neotectonics in seismic hazard assessment.
- CO4: Understand the factors responsible for atmospheric circulation and the phenomena associated with it

Course: Remote Sensing and GIS

- CO1: Understand the principles of remote sensing
- CO2: Learning Digitizing process and interpretation of remotely sensed data.
- CO3: Studying Satellite exploration programs and its characteristics
- CO4: Understand the idea of map projection and datum
- CO5: Idea and concept about various GIS databases
- CO6: DEM analysis and interpretation
- CO7: Understand the working principle and application of GPS in earth system science