Name of the Programme: B.Sc. Geology (CBCS)

Programme Outcomes (PO)

After completing the Three Year Undergraduate Programme in Geology, Students are expected to achieve the following Programme Outcomes:

PO1: Critical thinking

PO2: Communication Skills

PO3: Problem solving

PO4: Analytical reasoning

PO5: Research-related skills

PO6: Cooperation/Team work

PO7: Reflective thinking

PO8: Digital literacy/ Use of Modern Tools

PO9: Environmental Awareness

PO10: Practical Skills

PO11: Lifelong Learning

PO12: Social perspective

Programme Specific Outcomes (PSO)

The programme specific outcomes of the Undergraduate Programme in Geology are listed below. After completing the programme the students will be able to-

PSO1: Understand the basic knowledge of different components of Earth System, viz. lithosphere, biosphere, atmosphere and hydrosphere as well as their mutual interactions

PSO2: Conceptualise the basics of ore forming minerals and hydrocarbon, their formation and occurrence as well as estimate the minerals reserves present in rocks. Ability to differentiate ore minerals and rock forming minerals

PSO3: Develop critical thinking on application of different aspects of geology viz. mineralogy, structural geology, petrology and palaeontology in geological mapping and exploration of minerals, coal and petroleum.

Course Outcomes (CO)

B.Sc. 1st Semester

Course Title: Earth System Science

Course Code: C1T and C1P

On completion of this course, the students will be able to –

CO1 Explore, and understand the earth as a planet.

CO2 Develop understanding of its complex processes, past and future evolution and interaction with society.

CO3 Understand different components of earth system viz. complex interaction among lithosphere, biosphere and atmosphere.

CO4 Gain knowledge on characteristics and on different components of earth system.

CO5 Understand the practical aspects of Earth System Science.

Course Title: Crystallography and mineralogy

Course Code: C2T & C2P

At the end of this course, the students will be able to:

CO1 Gain knowledge on various crystal classes.

CO2 Understand the rock forming minerals.

CO3 Gain knowledge on physical and optical properties of minerals.

CO4 Apply the concepts mineralogy to understand the properties of rocks.

CO5 Understand the silicate structure and their significance.

B.Sc. 2nd Semester

Course Title: Geochemistry and Optical Mineralogy

Course Code: C3T & C3P

At the end of this course, the students will be able to:

CO1 Understand the basics of geochemistry and optical mineralogy

CO2 Understand the different groups of minerals and their optical properties

CO3 Understand about the geochemical association of minerals

CO4 Understand about the importance of geochemistry in mineralogy

CO5 Know about the optical properties shown by minerals and their basic knowledge

Course Title: Structural Geology and Plate Tectonics

Course Code: C4T & C4P

At the end of this course, the students will be able to:

CO1 Know and understand deformation in rocks.

CO2 Understand identification, classification and naming of folds & their genesis.

CO3 Understand identification, classification and naming of faults & their genesis.

CO4 Gain knowledge on characteristics of different types of deformational features & the tectonic importance.

CO5 Understand tectonic deformation of rocks and to acquire practical knowledge on deformation analysis.

B.Sc. 3rd Semester

Course Title: Igneous Petrology

Course Code: C5T & C5P

At the end of this course, the student will be able to:

CO1 Understand the scope and importance of igneous petrology.

CO2 Know the various types of igneous rocks.

CO3 Understand the normal and anomalous growth of minerals and their relation to magma evolution.

CO4 Know different properties of magma, their relation to mineral genesis and able to apply the knowledge in various fields for mineral exploration.

CO5 Analyze the different properties of igneous rocks in hand specimen and microscope.

Course Title: Sedimentary petrology

Course Code: C6T & C6P

At the end of this course, the student will be able to:

CO1 Know about the formation of sedimentary rocks and their classifications.

CO2 Know about sources of minerals observed in sedimentary rocks.

CO3 Know about various economic importance of studying sedimentary rocks.

CO4 Perform petrological studies for identifying sedimentary rocks.

CO5 Collect and identify sedimentary rocks of economic importance.

Course Title: Metamorphic petrology

Course Code: C7T & C7P

At the end of this course, the student will be able to:

CO1 Understand metamorphic rocks and types of metamorphism.

CO2 Understand the different types of metamorphic facies and grades of metamorphism.

CO3 Examine and evaluate mineral assemblages for petrogenetic study.

CO4 Practically know how to identify metamorphic rocks.

CO5 Gain practical knowledge of various petrographic characteristics of metamorphic rocks and their genesis.

B.Sc. 4th Semester

Course Title: Palaeontology

Course Code: C8T & C8P

At the end of this course, the student will be able to:

CO1 Gain an understanding of mode of preservation of fossils.

CO2 Understand the process of fossilization.

CO3 Learn about the morphological features of invertebrate and vertebrate fossils.

CO4 Apply the knowledge of biostratigraphy in different practical aspects of palaeontology.

CO5 Enhance their critical thinking about paleoenvironmental assessments.

Course Title: Stratigraphic Principles and Indian Stratigraphy

Course Code: C9T & C9P

At the end of this course, the students will be able to:

CO1 Explain basic principles of stratigraphy; relationships between stratigraphy and depositional environment.

CO2 Elaborate Indian stratigraphy

CO3 Discuss physiography, the major palaeotectonic evets of the world and different vegetational belts of the earth with characteristic paleoclimatic conditions of the area.

CO4 Identify physiographical regions of India, regional stratigraphy and its importance

CO5 Apply the knowledge of stratigraphy in studying depositional history and metallogeny.

Course Title: Hydrogeology and Oceanography

Course Code: C10T & C10P

At the end of this course, the students will be able to:

CO1 Understand the process of ground water infiltration and storage in rocks

CO2 Learn about the types of aquifers and assessment of its properties

CO3 Assess aquifers based on their morphology and quantify their storability using the hydraulic properties

CO4 Understand the evolution of ocean basins and their characteristics

CO5 Gain practical knowledge on various circulation patterns in global ocean basins through practical

B.Sc. 5th Semester

Course Title: Surveying & Engineering Geology

Course Code: C11T & C11P

At the end of this course, the student will be able to:

CO1 Know about the basics of surveying.

CO2 Understand the different methods and tools used in surveying.

CO3 Understand the different methods and tools used in levelling.

CO4 Understand the application of geological investigation for major engineering projects.

CO5 Understand different types of surveying methods through practical

Course Title: Geomorphology

Course Code: C12T & C12P

At the end of this course, the students will be able to:

CO1 Identify geomorphic environments

CO2 Understand the migration pathways of water and pollutants

CO3 Know about the functions of different geomorphic agents

CO4 Get exposed to various geomorphic processes involved in aggradation and degradation processes

CO5 Comprehend the effect of tectonics on landform developments

Course Title: Fuel Geology

Course Code: DSE1T & DSE1P

At the end of this course, the students will be able to:

CO1 To make the students acquainted with different tools and techniques used in petroleum exploration.

CO2 Have developed a very good understanding of the principles, working and applications of the instruments used in Coal Exploration.

CO3 Are able to critically evaluate and design experiments used in hydrocarbon exploration and reserve estimation.

CO4 Explain the theoretical aspects of key analytical techniques and instruments used in hydrocarbon exploration and reserve estimation.

CO5 Familiarize preparation and use of clay mineralogy for source rock assessment.

Course Title: Surveying & Mapping

Course Code: DSE2T & DSE2P

At the end of this course, the students will be able to:

CO1 Understand the scope and application of surveying Techniques.

CO2 Understand the surveying techniques and utilise the data for mapping.

CO3 Retrieve information from field works and incorporate in preparation of geological maps for research and practical applications.

CO4 Know about the application of remote sensing in geological mapping.

CO5 Gain knowledge on various fields-based techniques- surveying, mapping and profile sections.

B.Sc. 6th Semester

Course Title: Economic Geology: Coal & Petroleum

Course Code: C13T & C13P

At the end of this course, the students will be able to:

CO1 Understand and relate the different process of formation and extraction of earth materials that have economic potential in the society

CO2 Understand genesis, occurrences and distribution of mineral resources and its uses a raw material in mineral based industries

CO3 Understand the environmental issues related to mineral exploration and production.

CO4 Know the metallogenic provinces and epochs and its importance in mineral exploration

CO5 Demonstrate of plant metabolism processes

Course Title: Remote sensing: GIS & GPS

Course Code: C14T & C14P

At the end of this course, the students will be able to:

CO1 Get exposed to remote sensing tools and techniques.

CO2 Describe the components of GIS and their role in geological studies.

CO3 Construct digital mapping in GIS.

CO4 Understand the steps involved in GPS navigation and mapping.

CO5 Know the application of remote sensing in various fields of geoscience, environmental hazards and mitigation studies.

Course Title: Geology of North East India

Course Code: DSE3T & DSE3P

At the end of this course, the students will be able to:

CO1 Get Exposed to basic understanding on structural setting of North East India

CO2 Gain basic understanding on physiographic divisions of North East India

CO3 Gain basic understanding on tectonic divisions of North East India

CO4 Understand the mineral resources obtained in North East India.

CO5 Understand the environmental hazards in North East India.

Course Title: Earth & Climate

Course Code: DSE4T & DSE4P

At the end of this course, the students will be able to:

CO1 Gain basic knowledge about climate system.

CO2 Understand the interrelationship between different components of climate system.

CO3 Understand different processes related to atmospheric and oceanic circulations.

CO4 Get basic knowledge about the mechanism of Indian Monsoon.

CO5 Get sufficient numerical skills necessary for carrying out research, including data interpretation & statistical analysis, for paleoclimate analysis.

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