

DEPARTMENT OF EARTH SCIENCES
M.Sc. Geology (Five Year Integrated) Programme

19IGYT14: Physical and Dynamic Geology

Course Outcomes:

1. The students will gain knowledge about the geological processes that occur in the earth crust.
2. To know their causes and their effect on the structures of the earth crust and the landforms

of the surface.

19IGYT24: Paleontology

Course Outcomes:

1. Students will be able to understand animal life in the past of different phylum, their distribution.
2. Able to understand the importance of studying plants preserved as fossils.
3. Understand the importance of studying the fossils in the stratigraphic record.

19IGYP25: Practical – I Palaeontology

Course Outcomes:

1. Gain knowledge in ecology of animal and plant species.
2. Able to understand the evolution of organism in different periods.

19IGYT33: Structural Geology

Course Outcomes:

1. Students will understand about the rock dynamics.
2. They will understand the mechanical deformation of stress and strain for the formation

various structures.

1. They will gain knowledge on the mechanism of folds, faults and joints.

19IGYP34: Practical – II Structural Geology

Course Outcomes:

1. The students will have practical experience on the measurement of Geometry of geological

formation and understand the mapping of the geological features.

19IGYT43: Mineralogy and Crystallography

Course Outcomes:

1. Students will gain knowledge of the minerals and their formation.
2. Students will get the knowledge of the crystal structure.
3. Students will get knowledge of physical & chemical properties of minerals.
4. Understand the basics of crystals, formation and their classification.

19IGYP44: Practical – III Mineralogy and Crystallography

Course Outcomes:

1. Students will have the practical experience to identify the minerals through Megascop and

microscope.

1. They also get knowledge on the crystal face, symmetry and forms through the models.

19IGYT51: Stratigraphy and Indian Geology

Course Outcomes:

1. Students gain knowledge on the rock successions and the interpretation in terms of time scale.

2. They will have the knowledge of the physiographic division and rock successions in India.
3. Understand the distribution of various formations at different geological period.

19IGYT52: Economic Geology

Course Outcomes:

1. Students gain knowledge on the earth material that can be used economic resources.
2. Students will able to understand the properties and distribution of ore minerals in India.
3. Students will understand the various precious, metallic and non-metallic minerals occurrences and distribution throughout India.

19IGYT53: Igneous Petrology

Course Outcomes:

1. Students are will gain knowledge on the rocks and the conditions under which they form.
2. Students can understand the properties and classification of different types of igneous rocks.
3. Students are able to understand the process of formation of igneous rocks.

19IGYT54: Metamorphic and Sedimentary Petrology

Course Outcomes:

1. Students are will gain knowledge on the metamorphic and sedimentary rocks and the conditions under which they form.
2. Students can understand the properties and classification of different types of metamorphic and sedimentary rocks.
3. Students are able to understand the process of formation of metamorphic and sedimentary rocks.

19IGYP55: Practical – IV Economic Geology, Igneous, Metamorphic and Sedimentary Petrology

Course Outcomes:

1. Students will have hands on training to identify the economic and ore minerals.
2. Students will have practical experiences on the identification of the rock specimen
3. To know about the preparation of thin section of rocks

19IGYT61: Field Geology

Course Outcomes:

1. The student will gain knowledge from the field work, for the preparation of maps
2. They know about the different field sampling techniques.
3. They will be trained for plotting of the orientation of the structural features

19IGYT62: Fundamentals of Geospatial Technology

Course Outcomes:

1. The student will be exposed to the fundamental concepts of remote sensing and GIS
2. They will gain knowledge on the Geospatial software and hardware.
3. They know the technique of acquisition of spatial data by the use of GPS.

19IGYT63: Mineral Beneficiation

Course Outcomes:

1. Students gain the knowledge about the process by which valuable constituents are separated.
2. They will gain knowledge on the different ore processing techniques and equipments.

19IGYT64: Applied Geology**Course Outcomes:**

1. The students will gain the knowledge and understand the wide range of applied geosciences concepts.
2. The application of geology to mineral exploration, construction of engineering structures and water resource estimation.

19IGYP65: Practical – V Cartography, Aerial Photography, GIS and Mineral Dressing**Course Outcomes:**

1. The students will know the technique of map preparation, attributes addition
2. Students will have the field experience on use of GPS.
3. They will gain knowledge of the application of different GIS softwares in the lab.
4. They will have experience on the mineral processing methods.

19IGYT71: Structural Geology, Geomorphology and Tectonics**Course Outcomes:**

1. Students will gain the knowledge over mechanical properties of rocks.
2. Students will be able to understand the petrofabric and structural analysis of rocks.
3. Understand the concept of geomorphology, processes and landforms.
4. Understand the application of geomorphology and theories of paleomagnetism.
5. Students understand the concept of plate tectonics and theory.

19IGYT72: Mineralogy and Mineral Optics**Course Outcomes:**

6. Students will get insight into the mechanism & formation of minerals under different condition as their special features.
7. Understand the optical properties of minerals.
8. Understand the paragenesis of minerals.
9. Gain knowledge on how X-rays are useful in mineralogy studies.

19IGYT73: Indian Stratigraphy and Marine Geology**Course Outcomes:**

1. Students will acquire knowledge on distribution of rock types and their formation at different ages.
2. Understanding the ocean morphology and formation along with mineral resources of marine environment are known.

19IGYP74: Practical – VI Structural Geology, Mineralogy And Mineral Optics**Course Outcomes:**

1. The students will gain hands on training on the identification of mineral and its composition.
2. Students will be able to determine the three dimensional & visualization of crystals.

19IGYT81: Economic Geology, Mining Geology and Ore Genesis**Course Outcomes:**

1. The students will gain the knowledge in the mineral and ore formation processes.

2. They will have the knowledge on the methods & techniques in mining and also about the Mineral Economics concept.

19IGYT82: Coal and Petroleum Geology

Course Outcomes:

1. The students will gain knowledge on the mechanism of formation of coal & petroleum.
2. Understand the distribution of petroliferous and coaliferous basins of India.
3. The students will know the technique of exploration of hydrocarbon resources.

19IGYT83: Remote Sensing and GIS

Course Outcomes:

1. The students will gain knowledge on the principle & application of remote sensing.
2. They have the understanding on the techniques and details about various satellites & sensors.
3. They will know the techniques of & interpretation and exposure to functional and application aspects of GIS.
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19IGYP84: PRACTICAL – VII Economic Geology, Ore Petrology and Remote Sensing & GIS and Survey

Course Outcomes:

1. Students can understand to identify the ores.
2. The students will gain knowledge on ore reserve estimation.
3. The students will know the field Map projection techniques using GPS.
4. The student will interpret the GIS and GPS data.
5. The students will gain knowledge on the survey techniques.

19IGYT91: Igneous and Metamorphic Petrology

Course Outcomes:

1. To students will gain knowledge on the formation & types of Igneous and rocks.
2. The students will know the rock classification and how to name.
3. They will understand the influence of pressure and temperature influence on the formation of rocks.

19IGYT92: Sedimentology and Micropaleontology

Course Outcomes:

1. The students will gain knowledge about process, formation of sediments.
2. They know about the different sedimentary environments.
3. They could identify the sediments relating to different geological environment and types of organism existed.
4. They could understand about microfossils and their importance.

19IGYT93: Atmospheric Sciences

Course Outcomes:

1. The students will gain the knowledge about the atmospheric science,
2. They will understand the importance of the atmosphere and its role on the climatic condition and weather pattern.
3. They will know about the application of remote sensing for weather forecasting

19IGYP94: Practical – VIII Petrology, Sedimentology and Micropaleontology and Geological Mapping Report

Course Outcomes:

1. To students will get hands on training for preparation rock thin section.
2. They will know the techniques of rocks and mineral identification.
3. Students will able to interpret and identify the paleo-environmental condition of sediments.
4. The students will able to analyze the electrical resistivity data, seismic data and geochemical data for exploration of minerals.

19IGYT101: Geophysical Explorations

Course Outcomes:

1. Students will gain knowledge over geophysical exploration techniques.
2. Students will understand logging principles and concept.
3. Exposed to analysis and interpretation of different geophysical data.

19IGYT102: Geological and Geochemical Explorations

Course Outcomes:

1. Students will gain knowledge over geochemical survey techniques.
2. Students will understand sampling principles.
3. Students will understand various guides for geochemical explorations.
4. Understand the various geochemical element distributions.
5. Understand the various geochemical exploration techniques.
6. Exposed to analysis and interpretation of different geochemical data.

19IGYT103: Hydrogeology and Engineering Geology

Course Outcomes:

1. Students will gain knowledge on the types & mechanism of movement of groundwater.
2. Students will know on the criteria for construction of wells and water quality standards.
3. The students will get an exposure to the method of site selection for construction major engineering structures.

19IGYP104: Practical – IX Geophysics, Geochemistry, Hydrogeology and Engineering Geology. Mining Industry visit report

Course Outcomes:

1. Gain training on the chemical analysis of water.
2. They will be able to make the estimation of water resource potential.
3. They will be trained for the criteria for the selection of suitable sites for engineering structures.

19IGYP105: Project Work Dissertation & Viva-Voce

Course Outcomes:

1. Students will get hands on training in the reputed organization related to their subject.
2. Students will get trained in a specific field of specialization.
3. Students will have the practice of writing a project report

19 IGYE 16.1 Fundamentals of Geology

Course Outcomes:

1. Students able to understand the basis of the subject
2. Understand the different components to study in the course
3. Understand the branches of geology

19 IGYE 16.2 Physics and Chemistry of the Earth

Course Outcomes:

1. Students able to understand the basis of the subject
2. Understand the different physical and chemical components of earth.
3. Understand the environmental geochemistry.

19 IGYE 36.1 Fundamentals of Applied Geology

Course Outcomes:

1. Students able to understand the basis of the subject
2. Understand the different branches of applied geology.
3. Understand the relationship and importance of studying applied geology

19 IGYE 36.2 Geo-Heritage and Geo-Tourism

Course Outcomes:

1. Students gain knowledge on geological importance of the various places.
2. Students understand the importance of field visit of geological monuments.

19 IGYE 56.1 Introduction to Geological Software

Course Outcome:

1. Gain the knowledge of computer softwares in geology
2. Gain the knowledge of applications and interpretation of computer software.

19 IGYE 56.2 Natural Resources

Course Outcome:

1. Gain the knowledge of natural resources on the earth.
2. Gain the knowledge of distribution and management of resources.

19IGYE85.1: Environmental Geosciences & Disaster Management Credits: 3

Hours: 3

Course Outcomes:

1. The students will gain knowledge on the interaction between the human activities and the atmosphere, ocean and the solid Earth.
2. Understand the different environmental pollution, its causes and remedies.
3. They will gain the knowledge of the disaster management plan and methods

19IGYE85.2: Medical Geology Credits: 3

Course Outcomes:

1. Students will gain knowledge on geology and medicine.
2. Students will understand various elemental concentrations on the earth.
3. Exposed to health effects of fluoride, iodine and nitrate and their effects on human health.
4. Understand the environmental toxicology, speciation of trace elements and effects.

19IGYE95.1: Instrumentation and Analytical Techniques

(Elective-V)

Course Outcomes:

1. Gain knowledge on the application, advanced instruments to be used for analysis of water, rocks & minerals.
2. Students gain knowledge on the preparation of samples for different analysis.
3. Students understand the principles of various instruments for the study of geological samples.

**19IGYE95.2: Environmental Isotopes in Groundwater Hydrology
(Elective-V)**

Course Outcomes:

1. Understand the different isotopes and their distribution.
2. Gain knowledge on the water treatment.
3. Understand the distribution of important isotopes in the atmosphere.
4. Gain knowledge on the tracers.
5. Understand the dating and age determination using isotopes.

19IGYE86.1: Environmental Geosciences

Course Outcomes:

1. The students will gain knowledge on the interaction between the human activities and the atmosphere, ocean and the solid Earth.
2. Understand the different environmental pollution, its causes and remedies.
3. They will gain the knowledge of the disaster management plan and methods.

19IGYE96.1: Applied Geophysics

Course Outcomes:

1. Students will gain knowledge over geophysical exploration techniques.
2. Students will understand logging principles and concept.
3. Exposed to analysis and interpretation of different geophysical data.

DEPARTMENT OF EARTH SCIENCES
M. Sc. GEOLOGY (2Year Programme)

19GEO101: Structural geology, Geomorphology & Tectonics

Course Outcomes:

1. Students will gain the knowledge over mechanical properties of rocks.
2. Students will be able to understand the petrofabric and structural analysis of rocks.
3. Understand the concept of geomorphology, processes and landforms.
4. Understand the application of geomorphology and theories of paleomagnetism.
5. Students understand the concept of plate tectonics and theory.

19GEO102: Mineralogy and Mineral Optics

Course Outcomes:

1. Students will get insight into the mechanism & formation of minerals under different condition as their special features.
2. Understand the optical properties of minerals.
3. Understand the paragenesis of minerals.
4. Gain knowledge on how X- rays are useful in mineralogy studies.

19GEO103: Indian Stratigraphy and Marine Geology

Course Outcomes:

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

1. Students will acquire knowledge on distribution of rock types and their formation at different ages.
2. Understanding the ocean morphology and formation along with mineral resources of marine environment are known.

19GEO104: Structural Geology, Mineralogy and Mineral Optics

Course Outcomes:

1. The students will gain hands on training on the identification of mineral and its composition.
2. Students will be able to determine the three dimensional & visualization of crystals.

19GEO201: Economic Geology, Mining Geology And Ore Genesis

Course Outcomes:

1. The students will gain the knowledge in the mineral and ore formation processes.
2. They will have the knowledge on the methods & techniques in mining and also about the Mineral Economics concept.

19GEO202: Coal and Petroleum Geology

Course Outcomes:

1. The students will gain knowledge on the mechanism of formation of coal & petroleum.
2. Understand the distribution of petroliferous and coaliferous basins of India.
3. The students will know the technique of exploration of hydrocarbon resources.

19GEO203: Remote Sensing and GIS

Course Outcomes:

1. The students will gain knowledge on the principle & application of remote sensing.
2. They have the understanding on the techniques and details about various satellites & sensors.
3. They will know the techniques of & interpretation and exposure to functional and application aspects of GIS.

19GEO204: Practical – II Economic Geology, Ore Petrology And Remote Sensing & GIS and Survey

Course Outcomes:

1. Students can understand to identify the ores.
2. The students will gain knowledge on ore reserve estimation.
3. The students will know the field Map projection techniques using GPS.
4. The student will interpret the GIS and GPS data.
5. The students will gain knowledge on the survey techniques.

19GEO301: Igneous and Metamorphic Petrology

Course Outcomes:

1. To students will gain knowledge on the formation & types of Igneous and rocks.
2. The students will know the rock classification and how to name.
3. They will understand the influence of pressure and temperature influence on the formation of rocks.

19GEO302: Sedimentology and Micropaleontology

Course Outcomes:

1. The students will gain knowledge about process, formation of sediments.
2. They know about the different sedimentary environments.
3. They could identify the sediments relating to different geological environment and types of organism existed.
4. They could understand about microfossils and their importance.

19GEO303: Atmospheric Sciences

Course Outcomes:

1. The students will gain the knowledge about the atmospheric science,
2. They will understand the importance of the atmosphere and its role on the climatic condition and weather pattern.
3. They will know about the application of remote sensing for weather forecasting

19GEO304: Practical – III Petrology, Sedimentology and Micropaleontology And Geological Mapping Report

Course Outcomes:

1. To students will get hands on training for preparation rock thin section.
2. They will know the techniques of rocks and mineral identification.
3. Students will able to interpret and identify the paleo-environmental condition of sediments.
4. The students will able to analyze the electrical resistivity data, seismic data and geochemical data for exploration of minerals.

19GEO401: Geophysical Explorations

Course Outcomes:

1. Students will gain knowledge over geophysical exploration techniques.
2. Students will understand logging principles and concept.
3. Exposed to analysis and interpretation of different geophysical data.

19GEO402: Geological and Geochemical Explorations

Course Outcomes:

1. Students will gain knowledge over geochemical survey techniques.
2. Students will understand sampling principles.
3. Students will understand various guides for geochemical explorations.
4. Understand the various geochemical element distributions.
5. Understand the various geochemical exploration techniques.
6. Exposed to analysis and interpretation of different geochemical data.

19GEO403: Hydrogeology and Engineering Geology

Course Outcomes:

1. Students will gain knowledge on the types & mechanism of movement of groundwater.
2. Students will know on the criteria for construction of wells and water quality standards.
3. The students will get an exposure to the method of site selection for construction major engineering structures.

19GEO404: Practical – IV Geophysics, Geochemistry, Hydrogeology and Engineering Geology

Course Outcomes:

1. Gain training on the chemical analysis of water.
2. They will be able to make the estimation of water resource potential.
3. They will be trained for the criteria for the selection of suitable sites for engineering structures.

19GEO405: Project Work Dissertation & Viva-Voce

Course Outcomes:

1. Students will get hands on training in the reputed organization related to their subject.
2. Students will get trained in a specific field of specialization.
3. Students will have the practice of writing a project report

COURSE CODE: 19 GEOE 205.1 Course Title: ENVIRONMENTAL GEOSCIENCES & DISASTER MANAGEMENT

Course Outcomes:

1. The students will gain knowledge on the interaction between the human activities and the atmosphere, ocean and the solid Earth.
2. Understand the different environmental pollution, its causes and remedies.
3. They will gain the knowledge of the disaster management plan and methods.

19GEOE205.2: MEDICAL GEOLOGY

Course Outcomes:

1. Students will gain knowledge on geology and medicine.
2. Students will understand various elemental concentrations on the earth.
3. Exposed to health effects of fluoride, iodine and nitrate and their effects on human health.
4. Understand the environmental toxicology, speciation of trace elements and effects.

19GEOE305.1: Instrumentation and Analytical Techniques

Course Outcomes:

1. Gain knowledge on the application, advanced instruments to be used for analysis of water, rocks & minerals.
2. Students gain knowledge on the preparation of samples for different analysis.
3. Students understand the principles of various instruments for the study of geological samples.

19GEOE305.2: Environmental Isotopes In Groundwater Hydrology**Course Outcomes:**

1. Understand the different isotopes and their distribution.
2. Gain knowledge on the water treatment.
3. Understand the distribution of important isotopes in the atmosphere.
4. Gain knowledge on the tracers.
5. Understand the dating and age determination using isotopes.

19GEOE215.1: Environmental Geosciences**Course Outcomes:**

1. The students will gain knowledge on the interaction between the human activities and the atmosphere, ocean and the solid Earth.
2. Understand the different environmental pollution, its causes and remedies.
3. They will gain the knowledge of the disaster management plan and methods.

19GEOE315.1: Applied Geophysics**Course Outcomes:**

1. Students will gain knowledge over geophysical exploration techniques.
2. Students will understand logging principles and concept.
3. Exposed to analysis and interpretation of different geophysical data.