

**Mafatlal Gagalbhai Science Institute (Autonomous)**  
**(M. G. Science Institute), Ahmedabad**  
**Accredited “A” level by NAAC (3<sup>rd</sup> Cycle)**

**Managed by The Ahmedabad Education Society**

**Affiliated to**  
**Gujarat University**  
**(Recognized by University Grants Commission)**

**SYLLABUS**  
**(Outcome Based Education Pattern)**  
**For 3 years B. Sc. / 4 years B. Sc. (Honours) programme**  
**For**

**B. Sc. SEMESTER - III & IV**  
**Based on**  
**National Education Policy (NEP) 2020**

**For Graduate Degree in**

**GEOLOGY**  
**(Earth Sciences)**  
**(In force from June 2025)**

**Submitted by**  
**Geology Department**  
**M. G. Science Institute**  
**Navrangpura**  
**Ahmedabad – 380 009**

## **PROGRAM SPECIFIC OUTCOMES (PSOs)**

On completion of the course, the learner will be able to

### **PSO 1: Academic skills:**

- (i) Comprehend various branches of Mineralogy in detail such as optical mineralogy and crystallography. Grasp the knowledge of petrology, economic geology, physical geology, global tectonics and hydrogeology.
- (ii) Demonstrate the fundamental knowledge of the stratigraphy, paleontology, structural geology, geomorphology and dynamics of the earth.

### **PSO 2: Laboratory skills:**

Identification of minerals and rocks at megascopic and microscopic level. Study of crystal models with reference to forms. Modes of preservation of fossils and basic exercises of structural geology included.

### **PSO 3: Personal skills:**

Express the basic concepts of the most important branches of the subject. Communication skills developed through the participation in various programme related to the subject as well as during the data collection in the fieldwork.

### **PSO 4: Social skills:**

Social relevance of earth systems and processes related to other subjects.

## M. G. Science Institute (Autonomous)

### Design and Structure of Geology (Earth Sciences) UG Courses

Course Type/ Department	Sem ester	Course		Credit	Work Hours/ Week
		No.	Name		
Geology - Multidisciplinary Course- (GEMDC)	III	GEMDC 234 T	Petrology, Stratigraphy and Paleontology	2	2
		GEMDC 234 P	Mineralogy and Petrology Laboratory	2	4

#### COURSE OUTCOMES (COs):

On completion of the course, students will be able to

**CO 1:** Acquire the knowledge of most common rock types, their structures and importance.

**CO 2:** Articulate the basic concepts of stratigraphy and palaeontology.

**CO 3:** Apply the idea of Geological time scale with the age in million years.

**CO 4:** Practically they will be able to identify most common minerals, ores and rocks as well as how to distinguish it from each other in hand specimens.

**B. Sc. Semester III**  
**GEOLOGY - THEORY and PRACTICALS**  
**Course-wise detail syllabus**

**GEMDC 234 T**

**Petrology, Stratigraphy and Paleontology**

Unit	Course details
<b>Unit –1</b>	<b>Petrology:</b> Mode of occurrence and structures of igneous rocks – detailed study. Sedimentary rocks: Structures and importance of sedimentary rocks. Metamorphic rocks: Structures and their importance.
<b>Unit –2</b>	<b>Stratigraphy:</b> General principles and Laws of stratigraphy, Terminology of stratigraphy. Geological Time scale – major divisions of earth’s geologic history. Correlation and Homotaxis of strata. Lithostratigraphic, chronostratigraphic and biostratigraphic units. <b>Palaeontology:</b> Definition. Elementary ideas about origin of life, evolution, and fossil record. Systematic classification of organisms – their characters.

**Reference Books:**

- 1) Introduction to Physical Geology, A. K. Datta, Kalyani Publisher, New Delhi.
- 2) A Text Book of Geology, P. K. Mukerjee, World press.
- 3) A Text Book of Geology with Special Reference to India, G. B. Mahapatra.
- 4) The Principles of Petrology, G. W. Tyrell (1960), Asia Publishing House.
- 5) Invertebrate Palaeontology, H. Woods (1982), Cambridge University Press.

**GEMDC 234 P**

**Mineralogy and Petrology Laboratory**

Course details
<b>Megascopic identification of following minerals:</b> Bloodstone, Flint, Opal, Beryl, Fluorite, Halite, Talc, Asbestos, Apatite, Graphite, Calcite, Dolomite, Magnesite, Baryte, Gypsum. <b>Ores:</b> Limonite, Ilmenite, Siderite, Chalcopyrite, Malachyte. <b>Megascopic identification of following rocks:</b> Graphic Granite, Porphyritic Granite, Pegmatite, Obsidian, Pumice, Slate, Schist, Gneiss.

