Geology Department

Sr. No.	Course Code	Course Title	Course Objective	• Expected Outcome
1	GEL 101	General and Physical Geology, Mineralogy	This course is designed to enable students to acquire basic understanding of the earth as a planet, it's internal structure, weathering and geological agents and basics of mineralogy.	• General principles of Geology as a science. • Branches and scope of the subject. • Origin and characteristics of the earth. • Earth's internal structure and composition. • Geological processes like weathering, erosion and deposition with reference to glaciers, rivers, lakes and winds. • Physical properties of minerals and the identification of different minerals.
2	GEL 103	Optical Mineralogy, Crystallography and Petrology	The objective of this course is to understand the dynamics of the earth, Optical mineralogy, crystallography and basics of petrology.	• Volcanoes, earthquakes and mountains. • Polarisation, reflection, refraction, petrological microscope. • Characteristics of crystals, symmetry, notations and classification of crystals. • Magma, classification of rocks. • Origin, classification, textures, composition and uses of igneous, sedimentary and metamorphic rocks.
3	GEL 201	General Geology, Physical Geology, Hydrogeology, Stratigraphy, Palaeontology, Structural Geology and Economic Geology	This course aims to understand general and physical geology, stratigraphy, palaeontology, structural geology and economic geology principles.	• Students gain knowledge regarding economical important minerals its origin, mode of formation Indian occurrences, production and uses. • Knowledge related to seas and oceans and hydrogeology will increase for students. • Introductory knowledge of

				stratigraphy and palaeontology may be gained by the students. • Knowledge of terminology, elevation and relief, contours, outcrops dip, strikes, maps and scale will be increased which may be helpful in future. • Introductory knowledge of rock, ore and industrial minerals and study of mica and iron minerals can be carried out.
4	GEL 202	Optical Mineralogy, Crystallography, Petrology and Economic Geology	This course is designed to enable students to acquire basic understanding of optical mineralogy, crystallography, petrology and economic geology.	• Students acquire the knowledge of optical mineralogy and crystallography. • Students gain knowledge regarding economical important minerals its origin, mode of formation Indian occurrences, production and uses in detail. • Knowledge related to igneous intrusions, structures of all types of rocks and importance will increase and becomes helpful in the field.
5	GEL 204	Dynamics of the Earth, Stratigraphy, Physiography of India, Structural Geology and Economic Geology	These courses are designed to acquire more knowledge on dynamics of the Earth, stratigraphy, physiography of India, structural geology and economic geology.	• For knowledge of diastrophism and atmosphere, climate and weather which can lead to environment of present and future. • Students gain knowledge regarding economical important minerals and ores- its origin, mode of formation Indian occurrences, production and uses in detail.

				• .Knowledge of stratigraphy can be gained. • Use of primary and secondary structures and elementary knowledge of joints, faults and folds. Knowledge related to inliers outliers, unconformity and overlap.
6	GEL 205	Physical Geology, Soil, Chemical Mineralogy, Crystallography, Geomorphology, Engineering Geology and Palaeontology	The course imparts knowledge of different soil, gravity and magnetic fields and heat flow from the earth. It also includes chemical mineralogy, crystallography geomorphology, engineering geology, and palaeontology are also discussed in detail.	• Study of geophysical conditions of the earth such as gravity, magnetic conditions and heat flow. Soil is also discussed in detail. • Partial study of chemical mineralogy, crystallography and aspects and principles of applied geomorphology can be studied here. • Details of geology in relation to engineering and building stones are discussed in details. • Steps involved in study of various modes of fossilisation which would be helpful to understand palaeoclimatic conditions, habitants and evolutionary tendencies.
7	GEL 301	Mineralogy and Crystallography	Covers the structure of silicate minerals, Mineral families, Optical characters of minerals and Crystallography.	• Details of silicate structures. • Understanding of different mineral families. • Extinction, interference colours, interference figures and its sigh determination. • Tourmaline, quartz, gypsum and axinite types with forms. Twinning in

				crystals.
8	GEL 302	Petrology: Igneous and Metamorphic	The course imparts knowledge to understand the principles of petrology.	• The students can differentiate saturated, under saturated essential, accessory, and secondary minerals. • Magma, origin, crystallisation, classification and textures of rocks. • Types, textures, structures, composition of metamorphic rocks. • Imparting relationship between metamorphism, deformation, metamorphic processes and metasomatism.
9	GEL 303	Palaeontology and Sedimentary Petrology	The objective of course is to lay a foundation about basic Palaeontology and Sedimentary Petrology such that when they go to the next semester they are ready for understanding advanced Palaeontology and Sedimentary Petrology topics.	• Students will understand fundamentals/ general aspects of Mollusca. Classification of enzymes of Enzymes. They are also introduced to palaeoecology and palaeobotany. Detsiled knowledge of sedimentary rocks is provided here.
10	GEL 304	General and Standard Stratigraphy; Indian Stratigraphy (Peninsular)	The course imparts introduction of basic concepts of General and Standard Stratigraphy and detail study of Indian Stratigraphy with reference to Peninsular part.	• Development of awareness of palaeogeography, Igneous phenomena, petrographic province as well as Geological eras and their sub-divisions. • History of Geology of India, Major thrust Area of research. Important stratigraphic sections of different formations in India and their type areas.

				• Students are also exposed to correlation of the major Indian formations with their world equivalents. • The students are introduced to fundamental complex- Archaean-Dharwar, Cuddapah and Vindyan Super Groups and their mineral wealths. • Detail study of Post Archaean formations of Peninsular India - Gondwana Super Group, Mesozoic, Deccan Trap, Laterites, Tertiary and Quaternary of Peninsula. • Nature, origin and geology of Rajasthan desert and Rann of Kachchh and their economic importance. • Geology of Gujarat and associated mineral wealth.
11	GEL 305	Hydrogeology and Engineering Geology	As an elective course this aims to introduce basic understanding of Hydrogeology and Engineering Geology.	• Useful knowledge and techniques in hydrogeology and engineering geology is provided here.
12	GEL 307	Economic Geology	The course educates the concepts of Economic Geology in general, Economic minerals produced by igneous, sedimentary and metamorphic process, Economic deposits of	• Methods of mineral exploration. • Aspects of mineral exploitation. • Magmatic and related processes. • Weathering processes, Evaporation deposits. • Gossan deposits, sedimentary deposits like coal, petroleum, iron ores,

			India.	manganese ores, carbonates etc. • Distribution of different mineral deposits in India.
13	GEL 308	Indian Stratigraphy (Extra Peninsula) and Structural Geology	To expose and make the students competent in Geology both theory and practicals in all important areas and concepts. It aims to help students to correlate, inter relate it to Geology and Indian Stratigraphy (extra Peninsula), and Structural Geology.	• Students are taught comprehensive information of Indian stratigraphy related to extra-peninsula. • Students can gain detailed knowledge of joints, faults and folds with structural concepts of Himalaya and Aravalli mountain ranges.
14	GEL 309	Palaeontology	This course is designed to enable students to acquire understanding of the major types, evolutionary trend and distribution of various invertebrate and vertebrate phyla.	• Steps involved in identifying various invertebrate fossils megascopically which would be helpful to understand palaeoclimatic conditions, habitants and evolutionary tendencies.
15	GEL 310	Applied Geology	The objective of the paper is to give students detail knowledge of methods of prospecting, field techniques, environmental geology, geomorphology, neo-tectonics and global tectonics.	• Knowledge related to applied geology: geological mapping, use of clinometer compass and Brunton compass, geobotanical, geophysical and geochemical exploration methods can be gained by the students. • All these topics will help the students to work with topography, major landforms. drainage systems, geomorphological indicators, drainage changes, recurrent seismicity and its

				relation to structures and lithology which will give the students an insight about both research and consultancy in the field of applied aspects of geology. • Students will also gain knowledge regarding palaeomagnetism, sea floor spreading, island arcs and mid oceanic ridges.
16	GEL 311	Remote Sensing and GIS; Mining Geology	To create an interest in the applications of Geology in the fields of remote sensing and GIS and Mining Geology.	• Principles and applications of Remote Sensing. • Hardware and software modules of Geographic Information System (GIS). • Drilling, mining and sampling methods. • Logging and surveying using prismatic compass, altimeter and plane table.