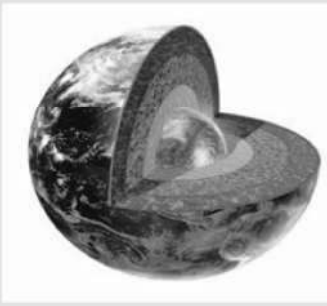
19PE202 FUNDAMENTALS OF GEOLOGY



SOURCE:
https://geologydegree.org/career-options-geology-majors/

Hours Per Week :

L	T	P	C
3	-	2	4

Total Hours :

L	T	P
45	-	30

WA/RA	SSH/HSH	CS	SA	S	BS
25	50	-	-	5	5

COURSE DESCRIPTION AND OBJECTIVES:

This basic course in general geology is designed to train the students to understand the basics of geology, viz: formation of earth, layers of earth, diverse types of rocks, formation of sedimentary basins and the micro fossils and their relationship to oil and gas.

COURSE OUTCOMES :

Upon completion of the course, the student will be able to active the following outcomes :

COs	Course Outcomes	POs
1	Analyze the dimension of earth structure, composition, origin of earth, formation of earth.	2
2	Identify the land forms of geomorphology, physiography and to gain a better perspective conforming to the present day thinking on the aspects of geology.	2
3	Design and evaluate essence of scientific studies dealing with the origin, age, structure of the earth.	3
4	Identify the modification, and extinction of various surface and subsurface physical features.	2
5	Design and develop geological contour maps by using appropriate software.	4
6	Interpret the structure of data with modern tool usage.	5

SKILLS:

- ✓ *Identify the origin of various kinds of igneous, sedimentary, metamorphic rocks that can be deciphered in terms of their tectonic setting.*
- ✓ *Gain the knowledge on fundamentals of sedimentary basins and paleontology and their significance to the petroleum industry.*

UNIT- I **L-9**

Dimensions of earth structure, composition & origin of an earth; Envelops of the earth: crust, mantle, core Internal dynamic process, plate tectonics, continental drift, earthquake and volcanoes; External dynamic process: Weathering, erosion and deposition.

UNIT- II **L-9**

Fundamental concepts in Geomorphology: geomorphic processes distribution of landforms-drainage patterns, development; Landforms in relation to rocks types, paleochannels, and buried channels.

UNIT- III **L-9**

Geological work of rivers, wind, ocean, glaciers and the landforms created by them; Identification of different structural features encountered in oil exploration viz: joints, faults, folds, unconformities.

UNIT- IV **L-9**

Origin of igneous, sedimentary and metamorphic rocks; Sedimentary structures, petrographic character of conglomerate, sandstone, shale, limestones; Introduction to sedimentary basins and deltaic systems; topographic maps, thematic maps, topographic and thematic profiles.

UNIT- V **L-9**

Paleontology: Introduction to paleontology, fossils and fossilization; Micropaleontology; Palynology; Distribution of microfossils: foraminifera, radiolaria, conodonts, ostracodes, diatoms; Importance of micro fossils in oil exploration.

LABORATORY EXPERIMENTS

List of Experiments **TOTAL HOURS-30**

1. Identification of Materials by visual inspection.
2. Identification of minerals in Hand Specimen.
3. Study of common rocks with reference to their structure, mineral composition and uses.
4. Location of observed outcrops on the Topo-sheet.
5. Measurement of the strike, dip and apparent and true thickness of the outcrops.
6. Preparation of the geological map of the area, structure contour maps and isopach maps for different stratigraphic levels.
7. Preparation of litho-stratigraphic columns, litho-stratigraphic correlation, geological cross sections.
8. Preparation of structural contour map.
9. Study of physical properties of minerals.
10. Geological mapping and traversing.

TEXT BOOKS:

1. Bell F. G., “Engineering Geology”, 2nd edition, Butterworth Heimann, 2007.
2. Mukharjee, P. K., “Text book of Geology”, The World Press Pvt. Ltd., 2005.

REFERENCE BOOKS:

1. Gribble, C. D., Rutley’s, “Elements of Mineralogy”, 27th edition, CBS Publishers, 2005.
2. David Duff, Homes, “Principles of Physical Geology”, 4th Revised edition, Nelson Thornes Ltd, 1992.
3. Mahapatra, G. B., “Text Book of Physical Geology”, CBS Publishers, 2002.
4. Bangar, K. M., “Principles of Engineering Geology”, 2nd edition, Standard Publishers, 2009.