

## B.E.Semester : III

### Civil Engineering

**Subject Name: ENGINEERING GEOLOGY (CV304)**

#### A.Course Objective

The objectives of the course are:

- To study and identify different types natural materials like rocks & minerals and soil.
- To understand the various natural dynamic processes their influence on the surfacial features, natural material and their consequences.
- To know the physical properties of rocks & minerals.
- To know the importance of geological maps and language helpful for Civil Engineering projects.

#### B. Teaching & Evaluation Scheme

Teaching scheme				Total Credit	Evaluation Scheme					Total Marks
L	T	P	Total		Theory		Mid Sem Exam	CIA	Pract/ Tut.	
Hrs	Hrs	Hrs	Hrs		Hrs	Marks	Marks	Marks	Marks	Marks
02	00	02	04	03	03	70	30	20	30	150

#### C. Detailed Syllabus

##### 1. Physical Geology

Introduction and scope of Geology and subdivision ,Internal structure of the earth, Weathering, erosion and denudations process on earth material and natural agencies, Geological work of wind, river underground water and glaciers.

Earthquakes: Basics of earthquake, earthquake history, seismic activity, concept of intensity and magnitude of earthquake, causes of earthquake, influence on civil structures and engineering consideration, seismic zonation, Stratigraphy of INDIA-Introduction

## 2. Mineralogy and Petrology

Study of physical properties of mineral and study of common rock forming minerals & way of formation of minerals, Study of three types of rocks with reference to their formation ,identification, textural and structural features Rocks and natural materials as a construction material

## 3. Structural Geology

Outcrop, stratification, dip and strike relation, Unconformity, joints their types and genesis Faults and folds with their types and causes, Engineering consideration of joints, folds and faults

## 4. Engineering Geology

Basics of Engineering Geology, Importance of geological studies to Engineers and significance of geological Investigations for civil engineering projects, Geology for Site selection of Dam, Tunnel, Reservoir and Highways

## 5. Mass Movement

Classification causes and effect of mass movements, stability of Slopes in unconsolidated materials, Influence of dip and slope Precautionary measures and control of mass movements, Case studies

## 6. Hydrogeology

Ground water and occurrence, investigations, quality, artificial recharging

### D. Lesson Planning

Sr. No.	Title of the Unit	Minimum Hours	Weightage%
1.	Physical Geology	07	25
2.	Mineralogy and Petrology	07	23
3.	Structural Geology	06	22
4.	Engineering Geology	04	13
5.	Mass Movement	04	12
6.	Hydrogeology	02	05

## LIST OF EXPERIMENTS:

Experiment No	Name of Experiment
1	Fundamental of Geology
2	Study of Physical Properties of Minerals
3	Identification of Minerals and Rock sample
4	Megascopeic Study of Rock Forming Minerals (Hand Specimen Study)
5	Megascopeic Study of Igneous Rocks
6	Megascopeic Study of Sedimentary Rocks
7	Megascopeic Study of Metamorphic Rocks
8	Introduction to Geological Maps for different structural features., Presentation of Beds Along Section and Construction of Geological History:

### E. Instructional method and pedagogy (Continuous Internal Assessment Scheme) (CIA)

- At the start of course, the course delivery pattern, prerequisite of the subject will be discussed.
- Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
- Theoretical concepts will be made more clear by showing different specimens of rocks, minerals, models and charts.
- Attendance is compulsory in lectures and laboratory which carries 5 Marks weightage.
- At regular intervals assignments is given. In all, a student should submit all assignments of 05 marks each.
- Classroom participation and involvement in solving the problems in Tutorial rooms carries 05 Marks.

- Viva Voce will be conducted at the end of the semester of 05 Marks.
- One internal exam will be conducted of 30 Marks as a part of internal theory evaluation.
- Assignment work will be given based on various geological issues related to civil projects and will be evaluated at regular interval. It carries a weightage of 5 Marks as a part of internal theory evaluation.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
- Experiments/Tutorials related to course content will be carried out in the laboratory.

#### **F. Students Learning Outcomes:**

On the successful completion of this course:

- The students will get the basic knowledge about natural material like rocks and minerals and their usage as well as their availability.
- The students will get acquainted with natural dynamic processes and their actions.
- The students will understand the influence of natural processes and geological factors on civil structures and help them to take decision while planning, design and execution stage of the structures in their professional life.
- The students will know the significance of geological investigations for civil engineering projects and site selection as well as for the preparation of feasibility reports and others.
- The knowledge of subject will also help them to understand the geological maps and language for the discussion on geological reports to resolve civil engineering issues.

#### **G. Recommended Study Material:**

##### **A. Text Books & Reference Books:**

1. Mukharjee, P.K., A text book of Geology, The World Press Pvt. Ltd.
2. Kesavulu, C., Textbook of Engineering Geology, Macmillan India Ltd, 1993, NewDelhi
3. Bangar, K.M, Principles of Engineering Geology, Standard Publishers Distributors, 1995, New Delhi
4. Billings, M.P., Structural Geology, Prentice-Hall India, 1974, New Delhi
5. Blyth, F.G.H and de Freitas, M.H. Geology for Engineers, ELBS, 1974London

6. Gokhale, KVG.K and Rao, D.M., Experiments in Engineering Geology, Tata-McGraw Hill, 1981, New Delhi
7. Kesavulu, C. Textbook of Engineering Geology, Macmillan, India Ltd., 1993, New Delhi
8. Lilesand, T.M. and Ralph W. Keifer., Remote sensing and Image Interpretation, John Wiley & Sons, 1987, New York.
9. Reddy, V. Engineering Geology for Civil Engineers; Oxford & IBH, 1997, New Delhi
10. Todd, D.K. Groundwater Hydrology, John Wiley & Sons, 1980, New York
11. Parbin Singh, Engineering Geology

**B. Web Materials:**

1. <http://nptel.iitm.ac.in/video.php?subjectId=105105106>
2. [http://nptel.iitm.ac.in/courses.php?branch=Civil,](http://nptel.iitm.ac.in/courses.php?branch=Civil)
3. <http://nptel.iitm.ac.in/video.php?courseId=1055&p=1>
4. <http://nptel.iitm.ac.in/video.php?courseId=1055&p=3>
5. <http://nptel.iitm.ac.in/video.php?courseId=1055&p=4>