

Course File

Engineering Geology (3CE4-08)

Semester: III Year: II (2023-24)

Name of faculty: Nishit Jain

Email ID: nishit.jain@technonjr.org

Total Number of Lectures: 28

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INDEX - COURSE FILE

VISSION & MISSION OF INSTITUTE	3
Vision.....	3
Mission.....	3
PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)	4
PROGRAM SPECIFIC OUTCOMES (PSO's)	6
PROGRAMME OUTCOMES (POs)	6
UNIVERSITY ACADEMIC CALENDAR	9
Evaluation Scheme	10
UNIVERSITY SYLLABUS	11
WEEKLY TIME TABLE OF THE TEACHER	12
COURSE-PLAN	13
Assignment Sheet	15
SAMPLE QUIZ QUESTIONS	17
Marks and Gap Analysis of Mid-Term 1	23
Remedial Action Taken to Remove the Gaps (After Mid- Term 1)	24
Marks and Gap Analysis of Mid-Term II	26
Remedial Action Taken to Remove the Gaps (After Mid- Term II)	27
STUDENT PERFORMANCE REPORT	34
RESULT ANALYSIS	35

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VISSION & MISSION OF INSTITUTE

Vision

Empowering student with recent and emerging technologies to create innovative technical leaders capable of contributing to industrial and societal needs for betterment of mankind across the globe.

Mission

M1: To provide dynamic learning environment to students by providing constant exposure to latest technologies by linking closely with the industries.

M2: To establish effective interface with industry to obtain live problems to enhance critical thinking and problem solving skills among students and consultancy projects for faculty.

M3: To provide avenues and opportunities to faculty for domain specific trainings and qualification upgradation.

M4: To develop ethical leaders with strong communication skills.

VISION & MISSION OF DEPARTMENT

Department Vision

To increase students learning of fundamentals for designing and planning of buildings and latest technologies through industry-aligned project-based learning which will help in transforming students to be good civil engineering professionals leading to innovation and incubation of new ideas.

Department Mission

- M1: To create experimental learning through solving problems of Government, Society, Smart Cities, Industry and other entities.
- M2: To teach the latest technologies to the students as beyond the syllabus activity so that they are updated and industry ready.
- M3: To enable engineering students understand industry-aligned technologies and learn to find solutions from their early engineering days and this is the only way to produce globally relevant engineers solving real-life problems applying current technologies.
- M4: To enable students to generate projects through problem faced by and requirement of Smart cities, industry, Government and other entities whereby those outlined problem statements are to be studied deeply by a group of faculty members to convert them into real-time project format.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

- PEOs 1: To provide an in-depth understanding of the fundamentals of Civil Engineering and create a foundation for lifelong learning to facilitate a progressive career in the construction Industry, as an entrepreneur and in pursuit of higher studies.
- PEOs 2: To equip the students with technical and analytical skills to develop innovative solutions to complex real-life problems using existing and novel technologies. To equip the students with good communication and interpersonal skills, inter-disciplinary teamwork and leadership skills to enable them to fulfill professional responsibilities.

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PEOs 3: To expose them to various contemporary issues which will enable them to become ethical and responsible towards themselves, co-workers, Society and the Nation.

PEOs 4: To make the student's industry ready by imparting education related to the latest technologies so that they can grab future industry jobs.

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PROGRAM SPECIFIC OUTCOMES (PSO's)

- PSO1: To be aware of and initiate some-work on future technologies and new developments which may impact the future Industry 4.0.
- PSO2: Hands on training on upcoming technologies and project-based learning.
- PSO3: Get exposure to BIM (Building Information Modeling).

PROGRAMME OUTCOMES (POs)

A student will develop:

- PO01. ENGINEERING KNOWLEDGE: An ability to apply knowledge of Mathematics, Science and Engineering Fundamentals in Electronics and Communication Engineering.
- PO02. PROBLEM ANALYSIS: Ability to analyze and interpret data by designing and conducting experiments. Develop the knowledge of developing algorithms, designing, implementation and testing applications in electronics and communication related areas.
- PO03. DESIGN/ DEVELOPMENT OF SOLUTION: An ability to Design a system Component or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- PO04. CONDUCTION OF INVESTIGATION OF COMPLEX PROBLEMS: Ability to Identify, formulate and solve engineering problems.
- PO05. MODERN TOOL USAGE: An ability to use the techniques, skills and modern engineering tools necessary for engineering practice.
- PO06. THE ENGINEERING AND SOCIETY: Broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and societal context.
- PO07. ENVIRONMENT & SUSTAINABILITY: Understand the impact of professional engineering solution in societal and environmental contexts, and demonstrate the knowledge of, and need of sustainable development.
- PO08. ETHICS: An ability to understand the professional, social and ethical responsibility.
- PO09. INDIVIDUAL AND TEAM WORK: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

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PO10. COMMUNICATION: An ability to Communicate effectively in order to succeed in their profession such as, being able to write effective reports and design documentation, make effective presentations.

PO11. PROJECT MANAGEMENT & FINANCE: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in team, to manage projects and in multidisciplinary environment.

PO12. LIFE-LONG LEARNING: Recognize the need and an ability to engage in life-long learning.

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Course Overview:

This course introduces the fundamental principles of engineering geology, focusing on the application of geological sciences to engineering projects. Students will learn how to assess and interpret natural processes and their impacts on human-made structures, providing essential geotechnical analysis and design recommendations. The course emphasizes the role of engineering geologists in mitigating hazards and ensuring the safety and stability of infrastructure.

By the end of the course, students will be equipped with the foundational knowledge required for careers in civil engineering, particularly in industries like mining and oil exploration, where geological considerations are critical to project success. This course is essential for those aspiring to roles in engineering geology and related fields.

Course Outcome:

3CE4-08	Cognitive Level	
3CE4-08.1	Understand	Define different types of rocks & minerals found on earth.
3CE4-08.2	Apply	List types of faults and folds in earth crust.
3CE4-08.3	Apply	State the difference between several minerals by examining their physical & chemical properties.
3CE4-08.4	Apply	Understand the remote sensing process and application in various fields of civil engineering.
3CE4-08.5	Apply	Analyse Engineering consideration of faults, fold, joints and unconformities, Dip and strike.

Prerequisites:

1. Explain different types of rocks & minerals found on earth
2. Explain faults and folds in earth crust.
3. Explain the difference between several minerals by examining their physical & chemical properties ascertain safe, stable and economical civil structures.
4. Recognize the fundamentals of the Earth as a planet, earth's dynamic actions and their importance for civil engineering structures.

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Mapping COs, POs and PSOs:

ENGINEERING GEOLOGY															
Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO23408.1	0	0	0	0	0	1	1	0	1	1	0	1	0	0	0
CO23408.2	0	0	0	0	0	1	1	0	1	1	0	1	0	0	0
CO23408.3	0	0	0	0	0	1	1	0	1	1	0	1	0	0	0
CO23408.4	0	0	0	0	0	1	2	0	2	1	0	2	0	0	0
CO23408.5	0	0	0	0	0	2	1	0	1	1	0	1	0	0	0

UNIVERSITY ACADEMIC CALENDAR

Academic Calendar for Odd Semester for Session

RAJASTHAN TECHNICAL UNIVERSITY KOTA				
Course: Bachelor of Technology (B.TECH.) for Odd Semester				
Semester	I	III	V	VII
Induction Program	17.08.2023			
Commencement of Classes	11.09.2023	24.08.2023	04.09.2023	04.09.2023
Commencement of First Mid Term	02.11.2023	03.10.2023	05.10.2023	05.10.2023
Commencement of Second Mid Term	07.12.2023	16.11.2023	20.11.2023	20.11.2023
Last Working Day	23.12.2023	02.12.2023	02.12.2023	30.11.2023
Commencement of Practical Exams	02.01.2024	04.12.2023	23.12.2023	14.12.2023
Commencement of Theory Exams	18.01.2024	14.12.2023	08.12.2023	07.12.2023
Winter Break				

ACADEMIC CALENDAR OF INSTITUTE

Techno India NJR Institute of Technology

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Academic Calendar

Academic Calendar for Odd Semester for Session 2023-24 (Odd Semester)

Course: Bachelor of Technology (B.TECH.)				
Semester	I	III	V	VII
Induction Program	10-08-2023			
Commencement of Classes	20-08-2023	11-09-2023	30-08-2023	22-08-2023
Commencement of First Mid Term	04-11.2023	02-11.2023	02-11.2023	27-09-2023
Commencement of Second Mid Term	15-01-2024	27-12-2023	27-12-2023	05-12-2023
Last Working Day	20-01-2024	12-01-2024	12-01-2024	20-12-2023
Commencement of Practical Exams	29-01-2024	15-01-2024	15-01-2024	31-12-2023
Commencement of Theory Exams	15-02-2024	30-01-2024	29-01-2024	27-12-2023

Evaluation Scheme

FACULTY DETAILS:

Name of the Faculty : Mr. Nishit Jain
Designation : Assistant Professor
Department : Civil Engineering

1. TARGET

- a) Percentage Pass : 100 %
- b) Percentage I class: 70 %

2. METHOD OF EVALUATION

- 2.1. Continuous Assessment Examinations (Mid-Term 1 & 2)
- 2.2. Assignments / Seminars
- 2.3. Mini Projects
- 2.4. Quiz
- 2.5. Semester Examination
- Others _____

3. List out any new topic(s) or any innovation you would like to introduce in teaching the subject in this Semester.

1. Take the help of creative tools to stimulate creativity. Include slide presentations, demonstration or forms of visual exercises that will excite the young minds and capture their interest.

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Signature of HOD

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UNIVERSITY SYLLABUS



RAJASTHAN TECHNICAL UNIVERSITY, KOTA

SYLLABUS

II Year - III Semester: B.Tech. (Civil Engineering)

3CE4-08: ENGINEERING GEOLOGY

Credit: 2
2L+0T+0P

Max. Marks: 100 (IA:30, ETE:70)
End Term Exam: 2 Hours

SN	Contents	Hrs.
1	Introduction to objective, scope and outcome of the course.	1
2	General Geology: Branches and Scope of Geology, Types of Weathering & Geological work of natural agencies like River & Wind. Geological Time Scale. Physical Properties of Minerals.	6
3	Petrology: Formation, Texture, Structure and Classification of Igneous, Sedimentary and Metamorphic Rocks. Engineering Properties of Rocks for Building & Road Material. Laboratory and Field & in-situ Test for Site Construction.	6
4	Structural Geology: Causes, Terminology, Classification, Recognition, Effects and Engineering consideration of Fold, Fault, Joints and Unconformities.	5
5	Engineering Geology: Geophysical methods as applied to Civil Engineering for Subsurface Analysis (Electrical and Seismic methods). Terminology, Types and Geological consideration for site selection of Dam & Tunnel.	6
6	Remote Sensing & GIS: Application of Remote Sensing and GIS in Various fields of Civil Engineering.	4
TOTAL		28

Office of Dean Academic Affairs
Rajasthan Technical University, Kota

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TEXT/REFERENCEBOOKS

1. Parbin Singh-A Text Book of Engineering & General Geology- S.K.Kataria & Sons.
2. S.K.Garg- Physical & Engineering Geology- Khanna Publishers.
3. Remote Sensing and GIS: B.Bhatta- Oxford Publishers.
4. M.T.Maruthesha Reddy- A Text book of Applied Engineering Geology- New Age International Publisher.

WEEKLY TIME TABLE OF THE TEACHER

First Time Table: with effect from (Date): Effective from 17 August 2023

Day	1	2	3	4	5	6	7
Monday				EG			
Tuesday							
Wednesday				EG			
Thursday							
Friday				EG			
Saturday							

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COURSE-PLAN

Lect. No.	UNIT	TOPICS	Teaching Methods/ Teaching Aids
1.	1	INTRODUCTION: Objective, scope and outcome of the course.	White Board, PPT,
2.	2	GENERAL GEOLOGY: internal structure of earth	White Board, PPT, Demonstration
3.	3	Types of weathering, and geological work of river	White Board
4.	3	Geological work of wind	White Board
5.	3	Geological time scale	White Board
6.	4	Physical properties of minerals	White Board, PPT
7.	4	Revision	White Board
8.	4	PETROLOGY: Formation, texture of igneous rocks	White Board
9.	5	Classification of Igneous rocks	White Board, PPT
10.	5	Formation and texture of sedimentary rocks	White Board
11.	5	Classification of sedimentary rocks	White Board
12.	6	Structure and classification of metamorphic rocks	White Board, PPT,
13.	6	Engineering properties of rocks lab and field test for construction site	White Board
14.	6	STRUCTURE GEOLOGY: Terminology, classification of folds	White Board, PPT, Demonstration
15.	6	Causes, recognition effect of folds and engineering consideration of folds	White Board
16.	6	Terminology and classification of faults and dip and strike problem	White Board
17.	6	Cause, terminology, classification engineering consideration of unconformity	White Board
18.	7	Terminology, classification of joint, cause, engineering consideration	White Board
19.	7	Cause, terminology, classification engineering consideration of unconformity	White Board, PPT
20.	7	ENGINEERING GEOLOGY: Geophysical method as application in civil engineering	White Board

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21.	7	Electric method	White Board, PPT
22.	7	Terminology and types of tunnels	White Board
23.	8	Geological consideration for site selection for tunnel	White Board, PPT,
24.	8	REMOTE SENSING AND GIS: introduction of RS and GIS	White Board
25.	8	Application of RS and GIS in land use	White Board, Demonstration
26.	8	Application in construction	White Board
27.	8	Application in Agricultural and irrigation	White Board
28.	8	Terminology and types of tunnels	White Board

Signature of Faculty:

Signature of HOD

Assignment Sheet

ASSIGNMENT NO. 1

CO.NO	Problem description
.	
1	<p>Explain detail scope of geology</p> <p>What is mineralogy Explain in detail</p> <p>Write a note on use of geology in construction</p> <p>Write a short note on use of geology in water resource development</p> <p>Write a note on physical geology</p>
2	<p>Write a note on igneous rock in detail.</p> <p>Write Chemical composition of Igneous rock in detail</p> <p>Explain in detail Sedimentary rock</p> <p>Explain in detail the Texture of Sedimentary rock</p> <p>Write a note Metamorphic rock and process of metamorphosis</p>
3	<p>Explain detail Structural features in detail.</p> <p>Write a note on Fold in detail.</p> <p>Explain in detail Classification of Fold in detail</p> <p>Explain in detail effects of Folds on Engineering projects</p> <p>Write about faulting in rocks in detail</p>
4	<p>Write about Surface investigation in geology</p> <p>Explain in detail Geophysical method of investigation</p> <p>Write a note on Resistivity method of Investigation</p>
	<p>D. Explain in detail Seismic Method of Investigation</p> <p>E. Write a note on Tunnels and Dams</p>
5	<p>Explain in detail Remote Sensing</p> <p>Explain in detail GIS</p> <p>Write a note on EMR</p> <p>Write a note on Signatures in detail</p> <p>Explain in detail application of Remote Sensing and GIS in civil Engineering</p>

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SAMPLE QUIZ QUESTIONS

Q1: What is the primary objective of studying Engineering Geology in civil engineering?

- a) To design mechanical systems
- b) To understand the properties of building materials
- c) To apply geological knowledge in solving civil engineering problems
- d) To study the flow of fluids in pipelines

Answer: c) To apply geological knowledge in solving civil engineering problems

Q2: Which of the following is NOT a branch of geology?

- a) Petrology
- b) Mineralogy
- c) Meteorology
- d) Structural Geology

Answer: c) Meteorology

Q3: The geological time scale is primarily used to:

- a) Measure the hardness of minerals
- b) Classify rocks
- c) Determine the age of the Earth and its formations
- d) Identify types of soils

Answer: c) Determine the age of the Earth and its formations

Q4: Which of the following is a type of physical weathering?

- a) Oxidation
- b) Frost action
- c) Hydrolysis
- d) Solution

Answer: b) Frost action

Q5: Rivers perform geological work through:

- a) Erosion, transportation, and deposition
- b) Compression and tension
- c) Folding and faulting
- d) Weathering and cementation

Answer: a) Erosion, transportation, and deposition

Q6: Which property of minerals describes the way a mineral reflects light?

- a) Cleavage
- b) Hardness
- c) Luster
- d) Streak

Answer: c) Luster

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Q7: Igneous rocks are primarily classified based on their:

- a) Color and weight
- b) Texture and mineral composition
- c) Hardness and luster
- d) Origin and chemical composition

Answer: b) Texture and mineral composition

Q8: Which of the following is a sedimentary rock?

- a) Granite
- b) Basalt
- c) Limestone
- d) Marble

Answer: c) Limestone

Q9: Metamorphic rocks are formed due to:

- a) Cooling and solidification of magma
- b) Deposition of sediments
- c) Alteration of pre-existing rocks under heat and pressure
- d) Weathering and erosion

Answer: c) Alteration of pre-existing rocks under heat and pressure

Q10: The engineering properties of rocks important for building materials include:

- a) Porosity and permeability
- b) Strength and durability
- c) Luster and streak
- d) Color and texture

Answer: b) Strength and durability

Q11: Which field test is commonly used to assess the suitability of rock for construction?

- a) Water content test
- b) Unconfined compression test
- c) Seismic refraction test
- d) Soil penetration test

Answer: b) Unconfined compression test

Q12: Folds in rocks are primarily caused by:

- a) Weathering
- b) Tectonic forces
- c) Chemical reactions
- d) Volcanic activity

Answer: b) Tectonic forces

Q13: The term "strike" in structural geology refers to:

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- a) The angle of inclination of a rock layer
- b) The horizontal direction of a rock layer
- c) The vertical displacement along a fault
- d) The surface exposure of a rock

Answer: b) The horizontal direction of a rock layer

Q14: Joints in rocks are significant in engineering because they:

- a) Increase the strength of rocks
- b) Allow the infiltration of water and weathering agents
- c) Cause rock layers to fold
- d) Have no impact on construction

Answer: b) Allow the infiltration of water and weathering agents

Q15: Which of the following is an unconformity?

- a) A type of joint
- b) A fold in a rock layer
- c) A gap in the geological record
- d) A volcanic intrusion

Answer: c) A gap in the geological record

Q16: The seismic refraction method is used in civil engineering primarily to:

- a) Determine the color of subsurface rocks
- b) Analyze the surface drainage patterns
- c) Investigate subsurface structures
- d) Identify mineral composition

Answer: c) Investigate subsurface structures

Q17: Which geophysical method is commonly used to detect underground water tables?

- a) Electrical resistivity method
- b) Seismic refraction method
- c) Magnetic survey
- d) Remote sensing

Answer: a) Electrical resistivity method

Q18: When selecting a site for a dam, which geological factor is most critical?

- a) The presence of abundant vegetation
- b) The strength and impermeability of the underlying rock
- c) The color and texture of the rock
- d) The altitude of the site

Answer: b) The strength and impermeability of the underlying rock

Q19: Tunnels are often constructed in areas with:

- a) Soft soil layers

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- b) Faulted and folded rock strata
- c) Unconsolidated sediments
- d) Stable, unfractured rock masses

Answer: d) Stable, unfractured rock masses

Q20: Remote sensing is most commonly used in civil engineering to:

- a) Measure the height of buildings
- b) Monitor large-scale environmental changes
- c) Design mechanical components
- d) Study fluid dynamics

Answer: b) Monitor large-scale environmental changes

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MID-TERM PAPERS

TECHNO INDIA NJR INSTITUTE OF TECHNOLOGY, UDAIPUR

B. TECH 2nd – YEAR (III SEM.) – MT-I

Engineering Geology (Subject Code: 3CE4-08)

Time: 2 Hr

Max. Marks: 70

Note:

- 1) The paper is divided into 2 parts: Part-A and, Part-B.
- 2) Part-A contains 10 questions and carries 2 mark each.
- 3) Part-B contains 5 questions. Each question is having two options and carries 10 marks each.

Part- A (20 Marks)

A.	Explain the term erosion	CO1
B.	What do you understand by geological time scale	CO1
C.	Define geology & Different branches of geology	CO1
D.	Define Weathering	CO1
E.	Explain the formation of igneous rocks	CO2
F.	Explain the texture of metamorphic rocks	CO2
G.	Write 4 examples of sedimentary rocks	CO2
H.	Name any 2 laboratory test for rocks	CO2
I.	Draw neat sketch for Folds terminologies	CO3
J.	Draw neat sketch for fault terminologies	CO3

Part- B (50 Marks)

1.	Write a note on scope of geology in civil engineering	CO1
	OR	
1.	Write a note on geological work of winds	CO1
2.	Write a note on geological work of rivers.	CO1
	OR	
2.	What are different physical properties of minerals	CO1
3.	Explain any 2 field test in details for site selection	CO2
	OR	
3.	What are different properties of rocks for road materials	CO2
4.	Write a note on classification of igneous rocks	CO2
	OR	
4.	Write a note on the classification of sedimentary rocks	CO2
5.	What are the causes & effects of FAULTS, site the importance in civil engineering	CO3
	OR	
5.	What are the causes & effects of FOLDS, site the importance in civil engineering	CO3

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Marks and Gap Analysis of Mid-Term 1

S.No	University Roll No.	Name of Student	Mid-Term 1 MM-70	Remark (Remedial Class need or not – Y/N)
1.	22ETCCE001	ANKIT KUMAR	52	N
2.	22ETCCE002	ARMAAN CHAUHAN	41	N
3.	22ETCCE003	AYUSH SINGH JHALA	50	N
4.	22ETCCE004	PARIDHI NINAMA	58	N
5.	22ETCCE005	PRAVEEN DANGI	56	N
6.	22ETCCE006	ROSHNI TABIYAR	61	N

*(Y, if obtained marks are <50%)

Signature of Faculty:

Signature of HOD

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Remedial Action Taken to Remove the Gaps (After Mid- Term 1)

S.no.	University Roll no.	Name of Student	Topics to be discussed in Remedial Class	Schedule Date of Remedial Class	Outcome Achieved
1.	NIL				
2.					

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Signature of HOD

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TECHNO INDIA NJR INSTITUTE OF TECHNOLOGY, UDAIPUR

B. TECH 2nd – YEAR (III SEM)
CIVIL ENGINEERING DEPARTMENT
Engineering Geology (3CE4-08)

Time: 2 Hr

Max. Marks: 70

Note:

- The paper is divided into 2 parts: Part-A, Part-B.
- Part-A contains 10 questions and carries 2 marks each.
- Part-B contains 5 questions. Each question has two options and carries 10 marks each.

PART A : 20 MARKS [WORD LIMIT 25 WORDS]		
a	Define Joints	CO3
b	What is unconformity	CO3
c	What is the objective of Geological investigation?	CO4
d	What are the 2 main sub-groups in which you divide the geological investigation	CO4
e	Explain the electrical method for sub-surface investigation.	CO4
f	What is the purpose of a dam?	CO4
g	Full form of GIS	CO5
h	Full form of RS	CO5
i	What you understand by least cost route alignment, w.r.t. To RS-GIS	CO5
j	How you can use RS to protect the environment?	CO5
PART B : 10 MARKS EACH [WORD LIMIT 200-250]		
1	Write a note on occurrence of joints	CO3
	OR	
	How are unconformities detected.	
2	Write a note on the site selection for a dam.	CO4
	OR	
	What are the different forces acting on dam? Explain with dig.	
3	Write down the criteria for site selection for a tunnel	CO4
	OR	
	What are the different surveys done before tunnelling?	
4	Write a note on application of RS in Civil Engineering	CO5
	OR	
	How does to use RS-GIS for site monitoring?	
5	Explain the integration of RS-GIS with CAD	CO5
	OR	
	How is RS helpful in town planning	

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Marks and Gap Analysis of Mid-Term II

Sr. No.	University Roll No.	Name of Student	Mid-Term 2 MM-70	Remark (Remedial Class need or not – Y/N)
1.	22ETCCE001	ANKIT KUMAR	51	N
2.	22ETCCE002	ARMAAN CHAUHAN	40	N
3.	22ETCCE003	AYUSH SINGH JHALA	49	N
4.	22ETCCE004	PARIDHI NINAMA	57	N
5.	22ETCCE005	PRAVEEN DANGI	55	N
6.	22ETCCE006	ROSHNI TABIYAR	60	N

*(Y, if obtained marks are <50%)

Signature of Faculty:

Signature of HOD

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Remedial Action Taken to Remove the Gaps (After Mid- Term II)

Sr. No.	University Roll no.	Name of Student	Topics to be discussed in Remedial Class	Schedule Date of Remedial Class	Course Outcome
1.	NIL				

Signature of Faculty:

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PREVIOUS YEAR PAPERS

3E1212	Roll No. _____	Total No. of Pages : 2
	3E1212 B.Tech. III Sem. (Main) Examination, April/May - 2022 Civil Engineering 3CE4-08 Engineering Geology	

Time : 2 Hours

Maximum Marks : 70

Instructions to Candidates:

Attempt all ten questions from Part A. All five questions from Part B and three questions out of Five questions from Part C.

Schematic diagrams must be shown wherever necessary. Any data missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

PART - A

(word limit 25)

(10×2=20)

1. Write scopes of Geology in Civil Engineering?
2. Describe unconformity in rocks?
3. Define fracture mineral properties?
4. Explain the term erosion?
5. Discuss about the Geological time scale?
6. Explain the texture of Metamorphic rocks?
7. What are engineering properties of rocks?
8. Differentiate structural geology and engineering geology?
9. What are the types of weathering?
10. Describe the terms fold and fault?

PART - B

(word limit 100)

(5×4=20)

1. Describe the features formed by river erosion?
2. Classify different types of faults?
3. Explain the texture and structure of sedimentary rocks?

3E1212 /2022

(1)

[Contd....

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4. Describe the seismic method for subsurface analysis?
5. Differentiate the various processes of Metamorphism?

PART - C

(Any three)

(3×10=30)

1. Explain the field and in - situ test for site construction?
2. Discuss the recognition of fold in field also classify folds?
3. Describe the geological consideration for site selection of Dam?
4. Discuss the application of Remote sensing and GIS in various fields of Civil Engineering?
5. Describe the Geophysical methods applied to civil Engineering for subsurface analysis.

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PART – B

(Analytical/Problem solving questions)

[4×10=40]

Attempt any four questions

- Q.1 Write an Essay on Scope of Geology for Civil Engineers.
- Q.2 Describe about identical characteristics of Igneous, Sedimentary & Metamorphic rocks.
- Q.3 Describe various types of Texture and Structures of Sedimentary rocks.
- Q.4 Define Parts of a Fold and Fault with diagram.
- Q.5 Describe various types of Dam and Draw a neat sketch showing various parts of a Dam.
- Q.6 Write a note on application of Remote Sensing in various fields.

PART – C

(Descriptive/Analytical/Problem Solving/Design Questions)

[2×15=30]

Attempt any two questions

- Q.1 Describe classification of Folds with diagram.
- Q.2 Write an essay on Geological Investigation of a Dam Site.
- Q.3 Describe various Geophysical Methods applied for subsurface analysis.

[3E1135]

Page 2 of 2

[3880]

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STUDENT PERFORMANCE REPORT

Roll No.	Name of Student	I Mid-Term	II Mid-Term	Average
22ETCCE001	ANKIT KUMAR	52	51	51.5
22ETCCE002	ARMAAN CHAUHAN	41	40	40.5
22ETCCE003	AYUSH SINGH JHALA	50	49	49.5
22ETCCE004	PARIDHI NINAMA	58	57	57.5
22ETCCE005	PRAVEEN DANGI	56	55	55.5
22ETCCE006	ROSHNI TABIYAR	61	60	60.5

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RESULT ANALYSIS

S.N O.	RTU ROLL NUMBER	NAME OF STUDENT	END TERM MARK S	SESSIONA L MARKS	TOTA L
			70	30	100
1.	22ETCCE001	ANKIT KUMAR	37	23	60
2.	22ETCCE002	ARMAAN CHAUHAN	2	18	20
3.	22ETCCE003	AYUSH SINGH JHALA	12	22	34
4.	22ETCCE004	PARIDHI NINAMA	42	26	68
5.	22ETCCE005	PRAVEEN DANGI	29	25	54
6.	22ETCCE006	ROSHNI TABIYAR	41	27	68

TOTAL	PASS	FAIL	ABSENT	PASS %
6	5	1	0	83.33 %

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Indirect Assessment:

Overall Teacher Self-Assessment (at the completion of course) in terms of course objective and outcomes

Course Objectives:

This course introduces the fundamental principles of engineering geology, focusing on the application of geological sciences to engineering projects. Students will learn how to assess and interpret natural processes and their impacts on human-made structures, providing essential geotechnical analysis and design recommendations. The course emphasizes the role of engineering geologists in mitigating hazards and ensuring the safety and stability of infrastructure.

By the end of the course, students will be equipped with the foundational knowledge required for careers in civil engineering, particularly in industries like mining and oil exploration, where geological considerations are critical to project success. This course is essential for those aspiring to roles in engineering geology and related fields.

Course Outcomes:

CO1: Define different types of rocks & minerals found on earth.

CO2: List types of faults and folds in earth crust.

CO3: State the difference between several minerals by examining their physical & chemical properties..

CO4: Understand the remote sensing process and application in various fields of civil engineering

CO5:..Analyse Engineering consideration of faults, fold, joints and unconformities, Dip and strike

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Methodology to identify bright student

Considered a range of criteria, including academic performance, creativity, critical thinking, problem-solving skills, and enthusiasm for learning. Bright students often excel in multiple areas. Observed how students perform in the classroom. In terms of active participation, engagement in discussions, leadership, and the ability to grasp complex concepts.

Efforts to keep students engaged

1. Active Learning:
 - Incorporate active learning strategies, such as group discussions, problem-solving activities, and hands-on projects. Active participation keeps students engaged and encourages critical thinking.
2. Varied Teaching Methods:
 - Use a variety of teaching methods, including lectures, group work, multimedia presentations, and interactive activities to cater to different learning preferences.
3. Technology Integration:
 - Leverage technology, such as online platforms, educational apps, and interactive software, to make lessons more engaging and interactive.

Methodology to identify weak student

Considered a range of criteria, including classroom observation, formative assessment, summative assessment, assignment review e.t.c. Weak students are struggling students with sensitivity and a desire to support their learning. Some measures, such as additional tutoring, personalized assignments, or alternative assessment methods, to help students succeed.

Targeted interventions for weak student

1. Additional Resources

Offer supplementary learning materials, such as textbooks, online resources, or multimedia content, to provide alternative explanations and reinforce key concepts.

2. Remedial classes

Establish a tutoring program where students can receive extra help from teachers.

3. Flipped classroom

Students are assigned pre-class learning materials, often in the form of videos, readings, or online modules, to cover the foundational concepts before coming to class.