

Techno India NJR Institute of Technology



Course File

Geotechnical Engineering Lab (5CE4-22)

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(Assistant Professor)
Department of CE

For Techno India NJR Institute of Technology
पंकज पौरवाल
Dr. Pankaj Kumar Porwal
(Principal)

RAJASTHAN TECHNICAL UNIVERSITY, KOTA

Syllabus

Year - V Semester: B.Tech. (Civil Engineering)

5CE4-22: GEOTECHNICAL ENGINEERING LAB

Credit: 1.5
0L+0T+3P

Max. Marks: 100(IA:60, ETE:40)
End Term Exam: 3 Hours

1	Grain size distribution by sieve Analysis and Hydrometer
2	Determination of specific Gravity by Pycnometer.
3	Determination of liquid limit by Casagrande's apparatus and cone penetrometer.
4	Determination of plastic limit and shrinkage limit
5	Determination of field density by core-cutter and sand replacement method
6	Determination of compaction properties by standard Proctor Test Apparatus.
7	Determination of C- ϕ values by unconfined compression Test Apparatus, Direct Shear Test Apparatus and Triaxial Test.
8	To determine the differential free swell index of soil and swelling pressure of soil.
9	To determine the CBR of soil.
10	To determine the compressibility parameters of soil by consolidation test.
11	To determine the permeability of soil by constant and falling head methods. Design as per syllabus of theory.

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Office of Dean Academic Affairs
Rajasthan Technical University, Kota

Syllabus of 3rd Year B. Tech. (CE) for students admitted in Session 2021-22 onwards

Course Overview:

Geotechnical engineering is the branch of civil engineering concerned with the engineering behavior of earth materials. Geotechnical engineering is important in civil engineering concerned with construction on or in the ground. Geotechnical engineering uses principles of soil mechanics and rock mechanics to investigate subsurface conditions and materials; determine the relevant physical/mechanical and chemical properties of these materials; evaluate; assess risks posed by site conditions; design earthworks and structure foundations; and monitor site conditions, earthwork and foundation construction.

Course Outcomes:

CO.NO	Cognitive Level	Course Outcome
1	Comprehension	Ability to identify the index properties of soils
2	Application	Students are able to determine the field density by sand replacement method
3	Analysis	Capable to find all consistency limits for soil.
4	Synthesis	Able to impart knowledge on the various factors governing the Engineering behavior of soils and the suitability of soils for various Geotechnical Engineering applications
5	Evaluation	Able to characterize stress-strain behaviour of soils, the failure criteria and to evaluate the shear strength and compressibility Parameters of soils.

Prerequisites:

1. Fundamentals knowledge of Soil Classification.
2. Fundamentals knowledge of Geotech lab Instruments.
3. Fundamentals knowledge of Properties of Soil.

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Course Outcome Mapping with Program Outcome:

Geotechnical Engineering Lab															
Course Outcome	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO1 0	PO1 1	PO12	PSO 1	PSO 2	PSO 3
CO422.1	3	2	2	2	2	1	1	1	2	1	1	2	2	1	1
CO422.2	2	2	1	1	1	2	1	1	2	2	2	1	1	1	1
CO422.3	3	2	2	2	2	1	1	1	2	1	1	2	2	1	1
CO422.4	2	2	2	1	2	2	2	2	1	1	2	1	1	1	1
CO422.5	2	2	2	2	1	1	0	0	0	1	0	0	1	1	1
CO422(AVG)	2.4	2	1.8	1.6	1.6	1.4	1	1	1.4	1.2	1.2	1.2	1.4	1	1

Course Coverage Module Wise:

LabNo.	Experiments List According to RTU Syllabus
1	Grain size distribution by sieve Analysis and Hydrometer
2	Determination of specific Gravity by Pycnometer.
3	Determination of liquid limit by Casagrande's apparatus and cone penetrometer.
4	Determination of plastic limit and shrinkage limit
5	Determination of field density by core-cutter and sand replacement method
6	Determination of compaction properties by standard Proctor Test Apparatus
7	Determination of C- ϕ values by unconfined compression Test Apparatus, Direct Shear Test Apparatus and Triaxial Test.
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Faculty Lab Manual Link

1. <https://drive.google.com/file/d/1btdIhAZkmemodx9S47L1vz6ZVjeUKB15/view?usp=sharing>

Viva QUIZ Link

1. <https://engineeringinterviewquestions.com/soil-mechanics-lab-viva-questions-answers/>
2. <https://www.sanfoundry.com/geotechnical-engineering-basic-questions-answers/>
3. <https://www.scribd.com/doc/213801751/Soil-Lab-Viva-Question>
4. <https://www.researchgate.net/topic/Geotechnical-Engineering>.

Assessment Methodology:

1. Practical exam using Geotech Experiments.
2. Internal exams and Viva Conduct.
3. Final Exam (practical paper) at the end of the semester.

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