



Kot Bhalwal, Jammu



Model Institute of Engineering  
& Technology (Autonomous)  
**Lab Handout**

## LABORATORY HANDOUT

GEOTECHNICAL ENGINEERING LAB (CE-512)

CE-5<sup>TH</sup> SEMESTER

ACADEMIC YEAR (2024-25)

**Ilyas Khaleel**

Assistant Professor

Department of Civil Engineering



Department of Civil Engineering

Model Institute of Engineering & Technology (Autonomous)

Kot Bhalwal, Jammu - 181122

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Dr. Arun K. Gupta Teaching-Learning Centre

Version 1.1



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Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
							Sessional	Final Exam	Total
CE-512	Geotechnical Engineering Lab	PCC	1	0	0	2	50	-	50

### COURSE OUTCOMES

At the end of the course the student will be able to:	
CO1	Analyze the soil density and Specific gravity of soil sample.
CO2	Calculate uniformity coefficient ( $C_u$ ) and coefficient of curvature ( $C_c$ ).
CO3	Analise the permeability of soil.
CO4	Explain the basics of compaction and consolidation.
CO5	Determine the shear characteristics and strength of soil.

### LIST OF EXPERIMENTS

S.No.	Title
1	Practice on dial gauge.
2	Determine the moisture percentage in Soils.
3	Determination of in-situ density by core cutter method and Sand replacement method.
4	Determination of Shrinkage Limit of Soil.
5	Identification of gravel type, sand type, silt type and clay types of soils.
6	Grain size analysis of sand and determination of uniformity coefficient ( $C_u$ ) and coefficient of curvature ( $C_c$ )
7	Determination of specific gravity of soil solids by pycnometer method.
8	Compaction test of soil in Standard Proctor test.
9	Determination of Relative Density of soil.
10	Perform Field density test of soil.
11	Determination of permeability by Constant Head Method.
12	To determine field density using core cutter method.
13	To determine shear parameters of cohesive soil by Unconfined Compression Test.
14	To determine the shearing strength of the soil using the direct shear apparatus (Direct Shear Test).
15	To find the shear of the soil by undrained triaxial test.
16	To determine the bearing capacity of soil by Standard Penetration Test (SPT).



### ADDITIONAL WEB RESOURCES

1.	VLAB LINK: Geotechnical Engineering Lab by IIT Madras which gives hands-on experience to the students. <a href="https://eerc01-iiith.vlabs.ac.in/List%20of%20experiments.html">https://eerc01-iiith.vlabs.ac.in/List%20of%20experiments.html</a>
2.	VLAB LINK: Geotechnical Engineering lab by IIT Hyderabad which gives hands-on experience to the students. <a href="https://www.vlab.co.in/ba-nptel-labs-civil-engineering">https://www.vlab.co.in/ba-nptel-labs-civil-engineering</a>
3.	VLAB LINK: Geotechnical Engineering Lab by IIT Madras which gives hands-on experience to the students. <a href="https://eerc01-iiith.vlabs.ac.in/List%20of%20experiments.html">https://eerc01-iiith.vlabs.ac.in/List%20of%20experiments.html</a>
4.	VLAB LINK: Geotechnical Engineering by IIT Delhi which gives hands-on experience to the students. <a href="https://www.vlab.co.in/ba-nptel-labs-civil-engineering">https://www.vlab.co.in/ba-nptel-labs-civil-engineering</a>

### LAB REPORT INSTRUCTIONS

- Provide specific title of the lab experiment.
- Theory: Provide a concise abstract (typically 100-200 words) that summarizes the purpose, methods, key findings, and significance of the experiment.
- Materials/ Equipment: List all materials, components, and equipment used in the experiment. Include specifications when applicable.
- Software/Simulation Tools:
- Experimental Procedure: Describe the step-by-step procedure for conducting the experiment. Be detailed and clear in your instructions. Include diagrams or schematics to illustrate the setup, connections, and component placement. Explain any variations or adjustments made to the standard procedure.
- Observation & Calculations/Analysis: Detail the data you collected during the experiment. Include descriptions of measurements and any calculations made. Use tables, charts, or graphs to present data clearly. Discuss any trends, patterns, or significant observations. Interpret the data in the context of the experiment's objectives. Ensure that all figures, tables, and equations are correctly labeled.
- Results: Summarize the key findings of the experiment. Present results in a clear and organized manner using tables and graphs. Include units of measurement and labels for data points.
- Conclusion: Provide a concise summary of the experiment's key points and outcomes.

### GRADING AND ASSESSMENT

- **Continuous Evaluation:** 30 marks
- **Final Demo & Viva:** 10 marks
- **Attendance:** 10 marks
- **Lab Overall Marks:** 50 marks

### COURSE POLICIES

- **Attendance:** Minimum 75% attendance is mandatory to appear in the final examination of the course.
- **Late Submissions:** Manuals and projects must be submitted by the specified timelines.

### FACULTY INFORMATION

- **Office Hours**





Monday (12:05 PM - 12:55 PM)

Friday (12:05 PM - 12:55 PM)

- **Contact Information**  
[Iliyas.civ@mietjammu.in](mailto:Iliyas.civ@mietjammu.in)

### RUBRICS FOR LAB CONTINUOUS EVALUATION

Parameters	Performance			Marks
	Low	Medium	High	
<b>Execution of the Experiment</b>	Student was not able to setup and conduct the Experiment completely	Student was able to setup and conduct the experiment but measurement/results/observations were not correct	Students was able to set and conduct the experiment and the measurement/results/observations were not correct	10
	0-2 Marks	3-6 Marks	7-10 Marks	
<b>Record</b>	Student was not able to describe the detailed procedure and could not record the measurement.	Student was able to describe the detailed procedure partially or with some inaccuracy.	Student was able to describe the detailed procedure accurately and record all measurements correctly.	10
	0-2 Marks	3-6 Marks	7-10 Marks	
<b>Viva Voice</b>	Students could not demonstrate sufficient knowledge of foundation, functional or applied aspects related to the experiment during viva.	Students demonstrated sufficient knowledge of foundation, functional or applied aspects related to the experiment during viva.	Students demonstrate strong knowledge of foundation, functional or applied aspects related to the experiment during viva	10
	<b>0-2 Marks</b>	<b>3-6 Marks</b>	<b>7-10 Marks</b>	
<b>Total Marks</b>				<b>30</b>