

**BHUBANANANDA ODISHA SCHOOL OF ENGINEERING, CUTTACK**  
**DEPARTMENT OF CIVIL ENGINEERING**  
**LESSON PLAN**



**LESSON PLAN**

**SUBJECT: GEOTECHNICAL ENGINEERING (TH 2)**

**FACULTY: SRI KSHITISH KUMAR SAHOO**

**ACCADEMIC SESSION: 2021-22**

**SEMESTER: 3<sup>RD</sup>**

**SEC: A**

**HOD / Sr. Lecturer (Civil Engg.)**

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<b>Discipline:</b> Civil Engineering	<b>Semester/ Section:</b> 3 <sup>RD</sup> / A		<b>Name of the teaching faculty:</b> SRI KSHITISH KUMAR SAHOO
<b>Subject:</b> Th2.Geotechnical Engineering	<b>No. of Days/ per week class allotted:</b> 04 period per week. (Tue, Thu, Fri, Sat)		<b>Semester From Date: 01-07-2024 To Date: 08-11-2024</b> <b>No. of weeks: 18</b>
<b>Week</b>	<b>Class Day</b>	<b>No of period available</b>	<b>Topics to be covered</b>
1 <sup>st</sup>	02.07.2024	1	<b>1 Introduction:</b> 1.1 Soil and Soil Engineering
	04.07.2024	1	1.2 Scope of Soil Mechanics, 1.3 Origin and formation of soil
	05.07.2024	1	<b>2 Preliminary Definitions and Relationship:</b> 2.1 Soil as a three Phase system.
	06.07.2024	1	2.2 Water Content, Density, Specific gravity.
2 <sup>nd</sup>	09.07.2024	1	2.2 Voids ratio, Porosity, Percentage of air voids, air content.
	11.07.2024	1	2.2 degree of saturation, density Index.
	12.07.2024	1	2.2 Bulk/Saturated/dry/submerged density, Interrelationship of various soil parameters.
	13.07.2024	1	Problems on chapter 2.
3 <sup>rd</sup>	16.07.2024	1	Problems on chapter 2.
	18.07.2024	1	Problems on chapter 2.
	19.07.2024	1	Problems on chapter 2.
	20.07.2024	1	<b>3 Index Properties of Soil:</b> 3.1 Water Content
4 <sup>th</sup>	23.07.2024	1	3.2 Specific Gravity
	25.07.2024	1	3.3 Particle size distribution: Sieve analysis, wet mechanical analysis, particle size distribution curve and its uses.
	26.07.2024	1	3.4 Consistency of Soils.
	27.07.2024	1	3.4 Atterberg's Limits.
5 <sup>th</sup>	30.07.2024	1	3.4 Plasticity Index, Consistency Index, Liquidity Index.
	01.08.2024	1	Problems on chapter 3.
	02.08.2024	1	Problems on chapter 3.
	03.08.2024	1	Problems on chapter 3.
6 <sup>th</sup>	06.08.2024	1	Problems on chapter 3.
	08.08.2024	1	Problems on chapter 3.
	09.08.2024	1	<b>4 Classification of Soil:</b> 4.1 General

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	10.08.2024	1	4.2 I.S. Classification, Plasticity chart
7 <sup>th</sup>	13.08.2024	1	4.2 I.S. Classification, Plasticity chart
	16.08.2024	1	Problems on chapter 4.
	17.08.2024	1	Problems on chapter 4.
	20.08.2024	1	<b>5 Permeability and Seepage:</b> 5.1 Concept of Permeability, Darcy's Law, Co-efficient of Permeability.
8 <sup>th</sup>	22.08.2024	1	5.4 Seepage pressure, effective stress, phenomenon of quick sand
	23.08.2024	1	5.4 Seepage pressure, effective stress, phenomenon of quick sand
	24.08.2024	1	5.4 Seepage pressure, effective stress, phenomenon of quick sand
	27.08.2024	1	Problems on chapter 5
9 <sup>th</sup>	29.08.2024	1	Problems on chapter 5
	30.08.2024	1	Problems on chapter 5
	31.08.2024	1	Problems on chapter 5
	03.09.2024	1	<b>Class test 1</b>
10 <sup>th</sup>	05.09.2024	1	<b>6 Compaction and Consolidation:</b> 6.1 <b>Compaction:</b> Compaction, Light and heavy compaction Test
	06.09.2024	1	6.1 Optimum Moisture Content of Soil, Maximum dry density, zero air void line.
	10.09.2024	1	6.1 Factors affecting Compaction, Field compaction methods and their suitability and problems.
11 <sup>th</sup>	12.09.2024	1	IA
	13.09.2024	1	IA
	14.09.2024	1	<b>6.2 Consolidation:</b> Consolidation.
	17.09.2024	1	6.2 distinction between compaction and consolidation.
12 <sup>th</sup>	19.09.2024	1	6.2 Terzaghi 's model analogy of compression/ springs showing the process of consolidation – field implications.
	20.09.2024	1	Problems on chapter 6.
	21.09.2024	1	Problems on chapter 6.
	24.09.2024	1	<b>7 Shear Strength:</b> 7.1 Concept of shear strength, Mohr- Coulomb failure theory
13 <sup>th</sup>	26.09.2024	1	7.1 Cohesion, Angle of internal friction, strength envelope for different type of soil.
	27.09.2024	1	7.1 Measurement of shear strength; - Direct shear test.

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	28.09.2024	1	7.1 triaxial shear test, unconfined compression test and vane-shear test.
14 <sup>th</sup>	01.10.2024	1	Problems on chapter 7
	03.10.2024	1	Problems on chapter 7
	04.10.2024	1	Problems on chapter 7
	05.10.2024	1	<b>8 Earth Pressure on Retaining Structures:</b> 8.1 Active earth pressure, Passive earth pressure, Earth pressure at rest.
	15.10.2024	1	8.2 Use of Rankine's formula for the following cases (cohesion-less soil only)
15 <sup>th</sup>	17.10.2024	1	8.2 (i) Backfill with no surcharge.
	18.10.2024	1	8.2 (ii) backfill with uniform surcharge.
	19.10.2024	1	Problems on chapter 8
	22.10.2024	1	Problems on chapter 8
16 <sup>th</sup>	24.10.2024	1	Problems on chapter 8
	25.10.2024	1	Class test 2
	26.10.2024	1	<b>9 Foundation Engineering:</b> 9.1 Functions of foundations, shallow and deep foundation.
	29.10.2024	1	9.1 different type of shallow and deep foundations with sketches.
17 <sup>th</sup>	01.11.2024	1	9.1 Types of failure (General shear, Local shear & punching shear)
	02.11.2024	1	9.2 Bearing capacity of soil, bearing capacity of soils using Terzaghi's formulae & IS Code formulae for strip, Circular and square footings, Effect water table on bearing capacity of soil.
	05.11.2024	1	9.3 Plate load test and standard penetration test.
18 <sup>th</sup>	07.11.2024	1	Previous year questions discussion.
	08.11.2024	1	Previous year questions discussion.