

Lesson Plan:

(4 periods per week, total 60 periods in SEM)

DISCIPLINE: Civil Engineering	SEMESTER: 6 th Semester	NAME OF THE TEACHING FACULTY: Laxmidhar Sahoo Guest Faculty (Civil Engg.)
SUBJECT: Geotechnical Engineering	NO OF DAYS/PER WEEK CLASSES ALLOTTED: 4	SEMESTER FROM DATE: 16.08.2024 TO DATE : _____ NO OF WEEKS: 15

Week	Class Day	Topics
		1.Introduction
1st	1ST	1.1 Soil and Soil Engineering
	2ND	1.2 Scope of Soil Mechanics 1.3 Origin and formation of soil
		2.Preliminary Defination and Relationship
	3RD	2.1 Soil as a three Phase system.
	4TH	2.2 Water Content, Density, Specific gravity
2nd	1ST	Voids ratio, Porosity, Percentage of air voids,
	2ND	air content, degree of saturation, density Index,
	3RD	Bulk/Saturated/dry/submerged density,
	4TH	Interrelationship of various soil parameters
3rd		3.Index Properties of Soil
	1st	3.1 Water Content
	2nd	3.2 Specific Gravity
	3rd	3.3 Particle size distribution: Sieve analysis, wet mechanical analysis, particle size distribution curve and its uses
	4th	3.4 Consistency of Soils, Atterberg's Limits, Plasticity Index, Consistency Index, Liquidity Index
		4.Classificatin of Soil
4th	1st	4.1 General 4.2 I.S. Classification,

	2 nd	4.2 I.S. Classification, Plasticity chart
	3 rd	4.2 I.S. Classification, Plasticity chart
	4 th	4.2 I.S. Classification, Plasticity chart
5 th	1 st	4.2 I.S. Classification, Plasticity chart
	2 nd	1.2 I.S. Classification, Plasticity chart
		5.Permiability and Seepage
	4 th	5.1 Concept of Permeability, Darcy's Law, Co-efficient of Permeability,
	5 th	5.2 Factors affecting Permeability.
6 th	1 ST	5.2 Factors affecting Permeability.
	2 nd	5.3 Constant head permeability and falling head permeability Test.
	3 rd	5.4 Seepage pressure, effective stress, phenomenon of quick sand
	4 th	5.4 Seepage pressure, effective stress, phenomenon of quick sand
7 th	1 st	Phenomenon of quick sand
		3.Compaction and Consolidation
	2 nd	6.1 Compaction: Compaction, Light and heavy compaction Test,
	3 rd	Optimum Moisture Content of Soil,
	4 th	Maximum dry density, Zero air void line,
8 th	1 st	Factors affecting Compaction,
	2 nd	Field compaction methods and their suitability
	3 rd	6.2 Consolidation: Consolidation, distinction between compaction and consolidation.
	4 th	Terzaghi's model analogy of compression/ springs showing the process of consolidation – field implications
9 th	1 st	Terzaghi's model analogy of compression/ springs showing the process of consolidation – field implications
		4.Shear Strength
	2 nd	7.1 Concept of shear strength, Mohr- Coulomb failure theory,
	3 rd	Cohesion, Angle of internal friction,
	4 th	strength envelope for different type of soil,
10 th	1 st	Measurement of shear strength;- Direct shear test, triaxial shear test, unconfined compression test and vane-shear test
	2 nd	Measurement of shear strength;- Direct shear test, triaxial shear test, unconfined compression test and vane-shear test
	3 rd	Measurement of shear strength;- Direct shear test, triaxial shear test, unconfined compression test and vane-shear test

5. Earth Pressure On Retaining Structures		
	4 th	8.1 Active earth pressure,
11th	1 st	Passive earth pressure,
	2 nd	Earth pressure at rest.
	3 rd	8.2 Use of Rankine's formula for the following cases (cohesion-less soil only) (i) Backfill with no surcharge, (ii) backfill with uniform surcharge
	4 th	8.2 Use of Rankine's formula for the following cases (cohesion-less soil only) (i) Backfill with no surcharge, (ii) backfill with uniform surcharge
12th	1 st	8.2 Use of Rankine's formula for the following cases (cohesion-less soil only) (i) Backfill with no surcharge, (ii) backfill with uniform surcharge
	2 nd	8.2 Use of Rankine's formula for the following cases (cohesion-less soil only) (i) Backfill with no surcharge, (ii) backfill with uniform surcharge
		6.Foundation Engineering
	3 rd	9.1 Functions of foundations, shallow and deep foundation,
13th	4 th	different type of shallow and deep foundations with sketches.
	1 st	different type of shallow and deep foundations with sketches.
	2 nd	Types of failure (General shear, Local shear & punching shear)
	3 rd	Types of failure (General shear, Local shear & punching shear)
	4 th	9.2 Bearing capacity of soil,
14th	1 st	9.2 Bearing capacity of soil,
	2 nd	bearing capacity of soils using Terzaghi's formulae
	3 rd	bearing capacity of soils using Terzaghi's formulae
	4 th	IS Code formulae for strip, Circular and square footings
15th	1 st	IS Code formulae for strip, Circular and square footings
	2 nd	Effect water table on bearing capacity of soil
	3 rd	9.3 Plate load test
	4 th	standard penetration test