NILASAILA INSTITUTE OF SCIENCE & TECHNOLOGY
SERGARH-756060, BALASORE (ODISHA)
(Approved by AICTE& affiliated to SCTE&VT, Odisha)

LESSON PLAN

SUBJECT: CEPC 207 TH-4 (GEOTECHNICAL ENGINEERING)

Name Of The Faculty :- Er.Jyotishree Sethi
Branch :- Civil Engineering **Semester :-** 3rd
Academic Year : 2025-26 **Examination :-** 2025 (w)

CHAPTER WISE DISTRIBUTION OF PERIODS

Sl.No.	Name of the chapter as per the Syllabus	No. of Periods as per the Syllabus	No. of periods actually needed
1	Overview of Geology and Geotechnical Engineering	5	6
2	Physical and Index Properties of Soil	8	12
3	Permeability and Seepage	8	12
4	Compaction,Consolidation and stabilization of soil	8	10
5	Shear Strength of Soil	8	11
6	Bearing Capacity of Soil and Foundation	8	9
	Total Period:	45	60

J. sethi
10.07.25
Sign of Faculty

10.7.2025
Sign of H.O.D.

Name of the programme: Diploma in CIVIL ENGINEERING	Semester: 3rd	**Name of the Teaching Faculty:** Er. Jyotoshree Sethi	
		Academic Year : 2025-26 **Examination :** 2025 (W)	
Course Code: CEPC 207 TH-4	**Course Year:** Second Year	**No. of Classes Alloted Per Week :**	4
		Planned Classes Required to Complete the Course	60

Week	Class Day	Topics to be Covered
1st	1st	**1.Overview of Geology and Geotechnical Engineering** Introduction of Geology, Branches of Geology, Importance of Geology for civil engineering structure and composition of earth.
	2nd	Definition of a rock ,Classification based on their genesis (mode of origin), formation. Classification and engineering uses of igneous, sedimentary and metamorphic rocks.
	3rd	Definition of a rock ,Classification based on their genesis (mode of origin), formation. Classification and engineering uses of igneous, sedimentary and metamorphic rocks.
	4th	Importance of soil as construction material in Civil engineering structures and as foundation bed for structures.
2nd	1st	Importance of soil as construction material in Civil engineering structures and as foundation bed for structures.
	2nd	Revision of Unit-I
	3rd	**2.Physical and Index Properties of Soil** Soil as a three phase system, water content, determination of water content by oven drying method as per BIS code.
	4th	Soil as a three phase system, water content, determination of water content by oven drying method as per BIS code.
3rd	1st	void ratio, porosity and degree of saturation, density index.,air Content,Percentage of air voids,Relation between the parameters.
	2nd	void ratio, porosity and degree of saturation, density index.,air Content,Percentage of air voids,Relation between the parameters.
	3rd	void ratio, porosity and degree of saturation, density index.,air Content,Percentage of air voids,Relation between the parameters.
	4th	Unit weight of soil mass – bulk unit weight, dry unit weight, unit weight of solids, saturated unit weight, submerged unit weight.
4th	1st	Unit weight of soil mass – bulk unit weight, dry unit weight, unit weight of solids, saturated unit weight, submerged unit weight.
	2nd	Determination of bulk unit weight and dry unit weight by core cutter and sand replacement method, Determination of specific gravity by pycnometer.
	3rd	Determination of bulk unit weight and dry unit weight by core cutter and sand replacement method, Determination of specific gravity by pycnometer.
	4th	Consistency of soil, Atterberg limits of consistency: Liquid limit, plastic limit and shrinkage limit. Plasticity index.

5th	1st	Particle size distribution test and plotting of curve, Determination of effective diameter of soil, well graded and uniformly graded soils, BIS classification of soil.
	2nd	REVISION OF UNIT -II
	3rd	**3.Permeability and Seepage** Definition of permeability, Darcy's law of permeability, coefficient of permeability.
	4th	Factors affecting permeability, determination of coefficient of permeability by constant head and falling head tests,
6th	1st	Factors affecting permeability, determination of coefficient of permeability by constant head and falling head tests,
	2nd	Simple problems to determine coefficient of permeability.
	3rd	Simple problems to determine coefficient of permeability.
	4th	Simple problems to determine coefficient of permeability.
7th	1st	Determine coefficient of permeability. Seepage through earthen structures, seepage velocity.
	2nd	Seepage velocity, seepage pressure, phreatic line, flow lines
	3rd	Application of flow net, (Concepts only No numerical problems).Effective stress,quick Sand
	4th	REVISION OF UNIT - III
8th	1st	**4.Compaction,Consolidation and stabilization of soil** Concept of compaction, Standard and Modified proctor test as per IS code, Plotting of Compaction curve for determining: Optimum moisture content (OMC).
	2nd	Maximum dry density (MDD), Zero air voids line. Factors affecting compaction, field methods of compaction – rolling, ramming and vibration.
	3rd	Consoildation,Difference between compaction and consolidation.Terzaghi's Model analogy of compression/springs showing the process of consolidation,Field implications
	4th	Concept of soil stabilization, necessity of soil stabilization, different methods of soil stabiliza tion. California bearing ratio (CBR) test - Meaning and Utilization in Pavement Construction

9th	1st	Necessity of site investigation and soil exploration: Types of exploration, criteria for decidingthe location and number of test pits and bores. Field identification of soil – dry strength test, dilatancy test and toughness test.
	2nd	Necessity of site investigation and soil exploration: Types of exploration, criteria for decidingthe location and number of test pits and bores. Field identification of soil – dry strength test, dilatancy test and toughness test.
	3rd	Revision of Unit-IV
	4th	**5.Shear Strength of Soil** Shear failure of soil-General,local and punching shear, concept of shear strength of soil.
10th	1st	Components of shearing resistance of soil – cohesion, internal friction.
	2nd	Mohr-Coulomb failure theory, Strength envelope, strength equation for purely cohesive and cohesion less soils.
	3rd	Direct shear, triaxial and vane shear test laboratory methods
	4th	NUMERICAL PROBLEM SOLVING CLASS
11th	1st	REVISION OF UNIT -V
	2nd	**6.Bearing Capacity of Soil and Foundation** Bearing capacity and theory of earth pressure. Concept of bearing capacity.
	3rd	**Bearing Capacity of Soil and Foundation** Bearing capacity and theory of earth pressure. Concept of bearing capacity.
	4th	Concept of bearing capacity, ultimate bearing capacity, safe bearing capacity and allowable bearing pressure.
12th	1st	Concept of bearing capacity, ultimate bearing capacity, safe bearing capacity and allowable bearing pressure.
	2nd	Introduction to Terzaghi's analysis and assumptions.
	3rd	Introduction to Terzaghi's analysis and assumptions.
	4th	Effect of water table on bearing capacity.
13th	1st	Effect of water table on bearing capacity.
	2nd	NUMERICAL PROBLEM SOLVING CLASS
	3rd	NUMERICAL PROBLEM SOLVING CLASS
	4th	REVISION OF UNIT -VI
14th	1st	**7.Field methods for determination of bearing capacity** Plate load and Standard Penetration Test. Test procedures as per IS:1888 & IS:2131. Definition of earth pressure, Active and Passive earth pressure for no surcharge condition
	2nd	Definition of earth pressure, Active and Passive earth pressure for no surcharge condition
	3rd	Definition of earth pressure, Active and Passive earth pressure for no surcharge condition.
	4th	Coefficient of earth pressure, Rankine's theory and assumptions made for non-cohesive Soils.

15th	1st	Coefficient of earth pressure, Rankine's theory and assumptions made for non-cohesive Soils.
	2nd	**Type of foundations-** Shallow foundation and Deep foundation
	3rd	REVISION OF UNIT -VII
	4th	Previous Year question Answer Discussion

J. sethi
10.07.25

Sign of Faculty

10.7.2025

Sign of H.O.D.