

# **GOPAL KRISHNA COLLEGE OF ENGINEERING & TECHNOLOGY**

**GOURAHARI VIHAR, PO: RANIPUT, JEYPORE – 764 005**

## **LESSON PLAN**

**Name of the Subject:** Advanced Geotechnical Engineering

**Name of the Faculty:** Niharika Nahak

**Semester:** 5<sup>th</sup> Semester

**Branch:** Civil Engineering

**Semester From:** July to December

**No. of Weeks:** 15 Weeks

<b>Week</b>	<b>Class Day</b>	<b>Theory/ Practical Topics</b>
1 <sup>st</sup>	1 <sup>st</sup>	MODULE 1- Stress distribution in soil: Boussinesq equations
	2 <sup>nd</sup>	Problem Practice
	3 <sup>rd</sup>	Stress isobar and pressure bulb concept, pressure distribution on horizontal and vertical planes
2 <sup>nd</sup>	1 <sup>st</sup>	stresses due to point load, line load, strip load, uniformly loaded circular and rectangular areas
	2 <sup>nd</sup>	Problem Practice
	3 <sup>rd</sup>	Use of Newmark's chart. Westergaard's solution
3 <sup>rd</sup>	1 <sup>st</sup>	Approximate methods (point load method, two-to-one load distribution method)
	2 <sup>nd</sup>	Contact pressure distribution due to loaded areas. Concept of active zone.
	3 <sup>rd</sup>	MODULE 2- Shallow foundation: Introduction
4 <sup>th</sup>	1 <sup>st</sup>	Bearing capacity, methods, and determination of bearing capacity
	2 <sup>nd</sup>	Problem practice
	3 <sup>rd</sup>	Settlement of foundations
5 <sup>th</sup>	1 <sup>st</sup>	Deep foundation: Classification of pile, pile driving methods
	2 <sup>nd</sup>	Pile capacity (static and dynamic analysis) pile-group analysis
	3 <sup>rd</sup>	Load test on piles.
6 <sup>th</sup>	1 <sup>st</sup>	Problem practice
	2 <sup>nd</sup>	Module-III: Subsoil exploration
	3 <sup>rd</sup>	Methods, direct (test pits, trenches)
7 <sup>th</sup>	1 <sup>st</sup>	Semi-direct (borings), indirect (sounding, penetration tests, and geophysical methods)
	2 <sup>nd</sup>	Planning of exploration programme
	3 <sup>rd</sup>	Spacing and depth of boring, soil sampling
8 <sup>th</sup>	1 <sup>st</sup>	Types of samples, standard penetration test
	2 <sup>nd</sup>	Static and dynamic cone penetration test
	3 <sup>rd</sup>	Problem Practice
9 <sup>th</sup>	1 <sup>st</sup>	In-situ vane shear test.
	2 <sup>nd</sup>	Problem Practice
	3 <sup>rd</sup>	Seismic refraction method, electrical resistivity methods.
10 <sup>th</sup>	1 <sup>st</sup>	Problem Practice

	2 <sup>nd</sup>	Module-IV: Lateral earth pressure and retaining structures
	3 <sup>rd</sup>	Earth pressure at rest, active and passive earth pressure
11 <sup>th</sup>	1 <sup>st</sup>	Problem Practice
	2 <sup>nd</sup>	Earth pressure theories, Rankine's theory
	3 <sup>rd</sup>	Problem Practice
12 <sup>th</sup>	1 <sup>st</sup>	Coloumb's wedge theory
	2 <sup>nd</sup>	Problem Practice
	3 <sup>rd</sup>	Rebhann's and Culmann's graphical methods, stability conditions for retaining walls.
13 <sup>th</sup>	1 <sup>st</sup>	Problem Practice
	2 <sup>nd</sup>	Problem Practice
	3 <sup>rd</sup>	Problem Practice
14 <sup>th</sup>	1 <sup>st</sup>	Problem Practice
	2 <sup>nd</sup>	Problem Practice
	3 <sup>rd</sup>	PREVIOUS YEAR QUESTION DISCUSSION
15 <sup>th</sup>	1 <sup>st</sup>	PREVIOUS YEAR QUESTION DISCUSSION
	2 <sup>nd</sup>	PREVIOUS YEAR QUESTION DISCUSSION
	3 <sup>rd</sup>	REVISION