20CE4701B - ADVANCED FOUNDATION ENGINEERING

Offering branch: CE			
Course Category:	Professional Elective	Credits:	3
Course Type:	Theory	Lecture-Tutorial-Practical:	3-0-0
Prerequisites:	20CE3402- Geotechnical Engineering 20CE4601B – Foundation Engineering	Continuous Evaluation:	30
		Semester End Evaluation:	70
		Total Marks:	100

Course Outcomes

Upon successful completion of the course, the student will be able to:

CO1	**Generalize** the bearing capacity equation and utilize it to determine soil bearing pressure	K2
CO2	**Assess** the bearing capacity of layered soils and slopes	K5
CO3	**Evaluate** the strain in sand	K5
CO4	**Evaluate** the strain in clay soil	K5
CO5	**Construct** the buildings at a shallow depth supported on mat or raft foundations	K6

Contribution of Course Outcomes towards achievement of Program Outcomes

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	2		2	2	2				2	2	2
CO2	2	2	2	2		3	3	3				3	2	3
CO3	3	3	3	3		3	3	3				3	3	3
CO4	2	2	2	2		3	3	3				3	2	3
CO5	2	2	2	2		3	3	3				3	2	3
Avg.	**2**	**2**	**2**	**2**		**3**	**3**	**3**				**3**	**2**	**3**

1- Low **2-Medium** **3-High**

Course Content

UNIT-1	**BEARING CAPACITY OF FOUNDATIONS**: Using general bearing capacity equation, Meyerhof's, Brinch Hansen's and Vesic's methods.	**CO1**
UNIT-2	**BEARING CAPACITY OF LAYERED SOILS:** Strong layer over weak layer, Weak layer on strong layer, bearing capacity of foundations on a top of slope, Bearing capacity of foundations at the edge of the slope.	**CO2**
UNIT-3	**SETTLEMENT ANALYSIS:** Immediate settlement of footings resting on granular soils, Schmertmann& Hartman method, De Beer and Martens method.	**CO3**
UNIT-4	**SETTLEMENT IN CLAYS**: Immediate settlement, Janbu's method, correction for consolidation settlement using Skempton and Bjerrum's method, Correction for construction period	**CO4**
UNIT-5	**MAT FOUNDATIONS:** Purpose and types of isolated and combined footings, Mats/ Rafts, Proportioning of footings.	**CO5**

Learning Resources

Text Books	1. Principles of Foundation Engineering, BM Das, CENTAG Learning 2. Soil Mechanics and Foundation Engineering, VNS Murthy, CBS Publishers
Reference Books	1. Foundation Analysis and Design, J.E. Bowles, John Wiley Foundation Design, W.C. Teng, Prentice Hall Publishers.
e-Resources& other digital material	1. https://nptel.ac.in/courses/105108069/