



DEPARTMENT OF CIVIL ENGINEERING

TEACHING PLAN

Course Code	Course Title	Semester	Branch	Contact Periods /Week	Academic Year	Date of commencement of Semester
23CE5T03	Geotechnical Engineering-I	V	CIVIL	06	2025-26	14-07-2025

COURSE OUTCOMES

1	Know different methods of index properties of the soils and classify the soils.(K2)
2	Understand the concept of seepage of water through soils. (K2)
3	Relate stress distribution in soils in day-to-day civil engineering practice. (K2)
4	Estimate the compressibility of soils.(K2)
5	Develop stress-strain behaviour of different soils.(K3)

UNIT	Out Comes / Bloom's Level	Topics No.	Topics/Activity	Text Book / Reference	Contact Hour	Delivery Method
I	Know different methods of index properties of the soils and classify the soils.(K2)	1.1	Introduction:	T1,R1	1	Chalk & Talk, PPT, Tutorial
		1.2	Soil formation	T1,R1	1	
		1.3	Structure of Soils	T1,R1	1	
		1.4	Texture of Soils – Three phase system and phase relationships.	T1,R1	1	
		1.5	Index Properties and Classification Tests of Soils: Index properties	T1,R2	1	
		1.6	Density Index - Grain size analysis	T1,R2	1	
		1.7	problems	T1,R1	1	
		1.8	Sieve and Hydrometer methods – Consistency of Clay Soils	T1,R1	1	
		1.9	Activity of Clays – Thixotropy of clays	T2,R1	1	
		1.10	problems	T2,R1	1	
		1.11	problems	T2,R1	1	



SWARNANDHRA

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		1.12	soil Classification – Unified soil classification and I.S. Soil classification.	T2,R1	1	
Total					12	
II	Understand the concept of seepage of water through soils. (K2)	2.1	Soil moisture and Capillarity: Introduction	T2,R1	1	Chalk & Talk, PPT, Tutorial
		2.2	Soil moisture and modes of occurrence	T2,R1	1	
		2.3	Total, Neutral and Effective Pressures	T2,R2	1	
		2.4	Problems	T2,R1	1	
		2.5	Problems	T2,R2	1	
		2.6	Capillary Rise in soils.	T2,R1	1	
		2.7	Problems	T1,R1	1	Chalk & Talk, PPT, Tutorial
		2.8	Problems	T1,R1	1	
		2.9	Permeability: Flow of water through soils	T1,R1	1	
		2.10	One dimensioned flow of water through soils – Darcy's law- permeability – Factors affecting	T1,R1	1	
		2.11	Laboratory determination of coefficient of permeability – Permeability of layered systems.	T1,R1	1	
		2.12	Problems	T1,R1	1	
Total					12	
III	Relate stress distribution in soils in day-to-day civil engineering practice. (K2)	3.1	Seepage and Flow Nets: Introduction	T2,R1	1	Chalk & Talk, PPT, Tutorial
		3.2	Flow net for one-dimensional flow – two-dimensional flow – Basic equation for Seepage	T2,R1	1	
		3.3	Flow nets & Characteristics and Uses	T1,R2	1	
		3.4	Quicksand condition –Seepage forces	T2,R2	1	
		3.5	Problems	T1,R2	1	
		3.6	Stress Distribution in Soils:	T2,R1	1	
		3.7	Stresses induced by applied loads	T1,R2	1	
		3.8	Boussinesq's and Westergaard's theories for point loads and areas of	T1,R1	1	



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			different shapes			
		3.9	Newmark's influence chart – 2:1 stress distribution method. - Pressure Blubs.	T1,R1	1	
		3.10	Problems	T1,R1	1	
		3.11	Problems	T1,R1	1	
		3.12	Problems	T1,R1	1	
			Total		12	
IV	Estimate the compressibility of soils.(K2)	4.1	Compaction: Mechanism of compaction	T2,R1	1	Chalk & Talk, PPT, Tutorial
		4.2	factors affecting	T2,R1	1	
		4.3	effects of compaction on soil properties	T1,R2	1	
		4.4	compaction control	T2,R1	1	
		4.5	Consolidation: Compressibility of soils	T1,R2	1	
		4.6	e-p and e-log p curves – Stress history	T2,R1	1	
		4.7	Concept of consolidation - Spring Analogy	T1,R1	1	
		4.8	Terzaghi's theory of one- dimensional Consolidation	T1,R1	1	
		4.9	Time rate of consolidation and degree of consolidation	T1,R1	1	
		4.10	Determination of coefficient of consolidation (c_v) - Over consolidated and normally consolidated clays.	T1,R1	1	
		4.11	Problems	T1,R1	1	
		4.12	Problems	T1,R1	1	
			Total		12	
V	Develop stress- strain behaviour of different soils.(K3)	5.1	Shear Strength of Soils: Introduction	T2,R1	1	Chalk & Talk, PPT, Tutorial
		5.2	Basic mechanism of shear strength - Mohr	T2,R1	1	
		5.3	Coulomb Failure theories	T2,R1	1	
		5.4	total and effective shear strength parameters	T1,R2	1	
		5.5	Stress-Strain behavior of Sands	T1,R1	1	
		5.6	Critical Void Ratio – Stress- Strain behavior of clays	T2,R1	1	
		5.7	Shear Strength determination- various drainage conditions –	T2,R1	1	



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			stress paths.			
		5.8	Shear Strength determination- various drainage conditions – stress paths.	T1,R2	1	
		5.9	Problems	T1,R2	1	
		5.10	Problems	T1,R2	1	
		5.11	Problems	T1,R2	1	
		5.12	Problems	T1,R2	1	
					Total	12
					CUMULATIVE PROPOSED PERIODS	60
Text Books:						
S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION					
1	Gopal Ranjan and A.S.R.Rao, "Basic and Applied Soil Mechanics", New Age International Publishers, 2018.					
2	B.C.Punmia, Ashok Kumar Jain & Arun kumar Jain, "Soil Mechanics and Foundations", Laxmi Publications, 16th edition, 2013.					
Reference Books:						
S.No.	AUTHORS, BOOK TITLE, EDITION, PUBLISHER, YEAR OF PUBLICATION					
1	R.F.Craig, "Soil mechanics", spon press, Talyor & Francis Group, London Seventh edition, 2017.					
2	Braja M. Das and Khaled Sobhan, "Principles of Geotechnical Engineering", Cengage Learning- USA, Eight edition, 2015.					
3	Holtz and Kovacs, "An introduction to Geotechnical Engineering", Prentice Hall, 2014.					
Web Details						
1	https://archive.nptel.ac.in/courses/105/101/105101201/					

	Name	Signature with Date
i. Faculty	G.VENKATA RAMANA	
ii. Course Coordinator	G.VENKATA RAMANA	
iii. Module Coordinator	G.VENKATA RAMANA	
iv. Programme Coordinator	G V L N MURTHY	


Principal