ATME COLLEGE OF ENGINEERING

DEAPRTMENT OF CIVIL ENGINEERING

COURSE OUTLINE FOR THE SESSION AUG-DEC 2025-26 (EVEN SEM)

Faculty Name: **SHRUTHI H G**
Subject with code: **Geotechnical Engineering – BCV502**
Semester with section: **V**

	Class No.	Date planned	Topics proposed to be covered	Portion to be covered in %	Remarks
Module 1	1	5/8/2025	**Bridge course**-Introduction to Geotechnical Engineering, Origin and Formation of soil	24	
	2	6/8/2025	Regional soil deposits in India, 3 Phase Diagram, definitions		
	3	8/8/2025	Phase Relationships and their inter relationships, Problems on Phase Diagram		
	4	12/8/2025	Determination of Index properties of soils: Specific gravity, water content		
	5	13/8/2025	In-situ density, Particle analysis (Sieve and Hydrometer analysis)		
	6	19/8/2025	Problems on Index properties of soils size, Atterberg's Limits-liquid limits		
	7	20/8/2025	Plastic limit, shrinkage limit, Activity of clay, Plasticity chart, Numerical problems		
	8	22/8/2025	Types of soil structures		
	9	26/8/2025	Valence bonds, Soil-Water system, Electrical diffuse double layer, Base-exchange capacity and Isomorphous substitution		
	10	29/8/2025	Clay minerals		
	11	2/9/2025	IS soil classification of soil		
Module 2	12	2/9/2025	**Module-2** Soil Permeability- Introduction, Definition	46	
	13	2/9/2025	Darcy's law, Determination of co-efficient of permeability & Coefficient of percolation		
	14	3/9/2025	Seepage velocity, superficial velocity, relation, Tests on Permeability-(Laboratory methods)		
	15	9/9/2025	Problems on Permeability, Numerical problems, Factors affecting permeability		
	16	10/9/2025	Permeability of stratified soils & Capillary phenomenon		
	17	16/9/2025	Seepage analysis –Laplace Equations, Introduction to Flow nets, Flow nets for sheet piles and below the dam section		
	18	17/9/2025	Phreatic line and problems		
	19	19/9/2025	Effective stress analysis, Impact of effective stresses in construction of structures & Quick Sand Phenomenon		
	20	23/9/2025	Problems on effective stress		
	21	24/9/2025	Problems on effective stress		

Module 3	22	26/9/2025	Compaction, principals of compaction	68	
	23	30/9/2025	Standard & modified compaction tests-problems		
	24	30/9/2025	Factors affecting compaction, effect of compaction on soil properties		
	25	30/9/2025	Field compaction control, Mass spring analogy, Terzaghi's 1D consolidation theory		
	26	3/10/2025	Consolidation characteristics of soil (Cc, av, mv and Cv)		
	27	8/10/2025	Laboratory one dimensional consolidation tests,		
	28	10/10/2025	Preconsolidation pressure		
	29	14/10/2025	Determination by Casagrande's method		
	30	21/10/2025	Numerical problems		
	31	24/10/2025	Numerical problems		
Module 4	32	28/10/2025	Mod-4 Introduction to Shear strength of soils	82	
	33	28/10/2025	Mohr stress circle, Thixotropy and sensitivity, Total and effective shear strength parameters		
	34	28/10/2025	Mohr coulomb failure criterion, Modified Mohr coulomb failure criterion		
	35	29/10/2025	Factors affecting shear strength of soils, Measurement of shear strength parameters - Direct shear test		
	36	31/10/2025	Measurement of shear strength parameters - Unconfined compression test, Triaxial compression test and		
	37	4/11/2025	Field Vane shear test and test under different drainage conditions, Problems on shear strength		
Module 5	38	5/11/2025	Bearing capacity-Types of foundation, Determination of bearing capacity by Terzaghi's and BIS methods (IS 6403)	100	
	39	7/11/2025	Modes of shear failures		
	40	11/11/2025	Factors affecting the bearing capacity of soil		
	41	12/11/2025	Effect of water table & load eccentricity on bearing capacity of soil		
	42	14/11/2025	Field method of determining bearing capacity of soil (SPT & plate load test)		
	43	18/11/2025	Numerical problems, Settlement – Types of settlement, importance		
	44	19/11/2025	Computation of immediate & consolidation settlement		
	45	21/11/2025	Permissible differential and total settlements (IS 8009 part 1), Numerical problems		

List of Text books
1. Bansal R. K., Rakesh Ranjan Beohar and Ahmad Ali Khan, Basic Civil Engineering and Engineering Mechanics, 2015,Laxmi Publications. 2. Kolhapure B K, Elements of Civil Engineering and Engineering Mechanics, 2014, EBPB
List of Reference books
1. Beer F.P. and Johnston E. R., Mechanics for Engineers, Statics and Dynamics, 1987, McGraw Hill. 2. Irving H. Shames, Engineering Mechanics, 2019, Prentice-Hall. 3. Hibbler R. C., Engineering Mechanics: Principles of Statics and Dynamics, 2017, Pearson Press. 4. Timoshenko S, Young D. H., Rao J. V., Engineering Mechanics, 5th Edition, 2017, Pearson Press. 5. Bhavikatti S S, Engineering Mechanics, 2019, New Age International 6. Reddy Vijaykumar K and Suresh Kumar K, Engineering Mechanics, 2011, BS publication