

**Shantilal Shah Engineering College, Bhavnagar**

**Applied Mechanics Department**

**Syllabus of Mid Semester Test [MST] for POST DIPLOMA DEGREE COURSE [PDDC] - 4th Semester Student [APRIL - 2022]**

#	Subject Code	Name of Subject	Date	Time	Syllabus
1	2940605	Soil Mechanics (Professional Elective - I)	18-04-2022	6:30 PM to 7:45 PM	<p><b>Slope Stability:</b> Infinite and finite slopes, factor of safety, type of slope failure, stability of infinite slopes, finite slopes forms of slip surfaces, limit equilibrium method and critical stage instability analysis, effects of tension crack and submergence, C-analysis-method of slices, Taylor's stability no., use of Bishop's method.</p>
					<p><b>Stress Distribution of Soils:</b> Causes of stress in soil, geostatic stress, Boussinesque's equation, stress distribution diagrams, New-mark's influence chart Westergard's equation, contact pressure, stresses due to triangular and other loadings.</p>
					<p><b>Subsurface Investigation:</b> Objectives of exploration, planning of exploration program, soil samples and soil samplers, field penetration tests: SPT, SCPT, DCPT., Introduction to geophysical methods, Bore log and report writing. Tests will be covered in lab sessions.</p>
					<p><b>Shear Strength:</b> Stress-Strain relationship in soil – Failure criteria – Mohr - Coulomb's failure theory – Shear parameters under different drainage conditions – Pore pressure parameters, – Analytical predictions of pore water pressure – stress dilatancy theory – results of plain strain shear tests – Forces on shear parameters – Stress path and its applications – Rheological models. Tests will be covered in lab sessions.</p>
2	2940601	Structural Analysis - I	19-04-2022	6:30 PM to 7:45 PM	<p><b>Unit-1 : Fundamentals of Statically Determinate Structures Basics:</b> Types of statically determinate &amp; indeterminate structures, static and kinematic indeterminacy, stability of structures, principle of superposition, Maxwell's reciprocal theorems. <b>Thin cylinder:</b> Analysis of thin cylinder and spherical vessels under pressure.</p>
					<p><b>Unit-2 : Strain energy &amp; Displacement of Statically Determinate structures</b> <b>Strain Energy :</b> Resilience, strain energy due to axial loads &amp; flexure, proof resilience, modulus of resilience, impact loads, and sudden loads <b>Displacement :</b> Differential equation of elastic curve, relation between moment, slope and deflection, Displacement of beam by <b>Macaulay's method - Only</b></p>
					<p><b>Unit-3 : Direct and Bending stresses + Column &amp; Struts (B) Columns and Struts Basics:</b> Buckling of columns, different end conditions, effective length, least radius of gyration <b>Applications:</b> Euler's and Rankine's formulae, columns with initial curvature, eccentrically loaded columns, columns with lateral loading.</p>