

# GUJARAT TECHNOLOGICAL UNIVERSITY

## DIPLOMA IN CIVIL ENGINEERING

### SEMESTER: V

Subject Name: **Practices of Design of Concrete Structures**

Sr. No.	Course Content
1.	<b>Singly Reinforced Beam</b> (10 Problems) <ul style="list-style-type: none"> <li>1.1. Select and solve at least three problems for finding Mu of rectangular beams</li> <li>1.2. Select and solve at least three problems for design and detailing of flexural reinforcement</li> <li>1.3. Select and solve at least three problems for design and detailing of shear reinforcement with and without bent up bars</li> <li>1.4. Select and solve a problem for Design and detail cantilever balcony</li> </ul>
2.	<b>Doubly Reinforced Beam</b> (6 Problems) <ul style="list-style-type: none"> <li>2.1 Solve at least three problems for finding Mu of rectangular beams</li> <li>2.2 Solve at least three problems for design and detailing of flexural reinforcement</li> </ul>
3.	<b>Tee Beam</b> (4 Problems) <ul style="list-style-type: none"> <li>3.1 Solve at least three problems for finding Mu of TEE beams (Problems are so selected that cases of <math>X_u \leq D_f</math>, <math>D_f \leq \frac{3}{7} X_u</math> and <math>D_f &gt; \frac{3}{7} X_u</math> each is included)</li> <li>3.2 Select and solve a problem for Design and detail a TEE beam</li> </ul>
4.	<b>One Way Slab</b> (3 Problems) <ul style="list-style-type: none"> <li>4.1 Select a problem on design and detail of One way simply supported slab with all necessary provisions of flexure, shear, bond, deflection and cracking</li> <li>4.2 Select a problem on design and detail of One way continuous slab with all necessary provisions of flexure, shear, bond, deflection and cracking</li> <li>4.3 Select a problem on design and detail of waist slab for stair without stringer beam with all necessary provisions of flexure, shear, bond, deflection and cracking</li> </ul>
5.	<b>Two Way Slab</b> (2 Problems) <ul style="list-style-type: none"> <li>5.1 Select a problem on design and detail of Two way simply supported slab with torsion reinforcement and all necessary provisions of flexure, shear, bond, deflection and cracking</li> <li>5.2 Select a problem on design and detail of Two way simply supported slab without torsion reinforcement and all necessary provisions of flexure, shear, bond, deflection and cracking</li> </ul>

6.	<b>Axially Loaded Short Column (5 Problems)</b> <p>6.1 Select at least three problems (one each for square, rectangular and circular section) for finding <math>P_u</math> of columns</p> <p>6.2 Select Two problem on design and detail of axially loaded short column with all necessary provisional checks</p>
7.	<b>Isolated Column Footing (2 Problems)</b> <p>7.1 Select a problem for isolated pad footing and all necessary provisions of flexure, one way and two way shear, bearing, bond and cracking</p> <p>7.2 Select a problem for isolated slopped footing and all necessary provisions of flexure, one way and two way shear, bearing, bond and cracking</p>
8.	<b>Miscellaneous Structures (Sketches on A<sub>4</sub> size papers)</b> <p>8.1 Details the reinforcement of One way simply supported slab, One way continuous slab, Two way simply supported slab with and without torsion steel, Short columns (Rectangular and Circular), Pad footing, Sloped footing</p> <p>8.2 Detail the reinforcement for cantilever bus stop shed</p> <p>8.3 Detail the reinforcement for Circular water tank with flexible base</p> <p>8.4 Detail the reinforcement for Circular water tank with rigid base</p> <p>8.5 Detail the reinforcement for Rectangular water tank vessel</p> <p>8.6 Detail the reinforcement for Cantilever retaining wall</p> <p>8.7 Detail the reinforcement for Counterfort type retaining wall</p> <p>8.8 Detail the reinforcement for beam and intermediate column joint for ductility</p> <p>8.9 Detail the reinforcement for beam and end column joint for ductility</p> <p>8.10 Special confining reinforcement detail for beam and column ductility</p>

### Note:

1. Student shall use uniform ruled pages for calculations for problems and blank A4 size papers for sketches.
2. Student shall furnish detailed drawings on three A2 size drawing sheets containing details of One way simply supported slab, One way continuous slab, Two way slab with and without torsion reinforcement, column and column footing.

### Laboratory Experiences:

1. IS – 456:2000, IS – 875:1987, IS – 13920-1993
2. SP-16: Design Aids to IS – 456
3. SP-34: Reinforcement detailing