

## *Reinforced Concrete Design, Course Content (BSc)*

<i>Lecture No.</i>	<i>Title</i>	<i>Content</i>
1	Introduction	Concept of Demand and Capacity, Flexural Design of Beams using ACI Recommendations, Shear Design of Beams using ACI Recommendations, Example
2	Analysis and Design of One-way Slab System (Part-I)	Concrete Floor Systems, Analysis and Design of Slabs, Basic Design Steps, Example: Design of 90' x 60' Hall, References
3	Analysis and Design of One-way Slab System (Part II)	Design Problem: Option 2 for Design of Hall, References
4	Analysis and Design of Two-way Slab System (Part-I: Two Way Slabs Supported on Stiff Beams Or Walls)	Behavior, Moment Coefficient Method, Steps in Moment Coefficient Method, Design Example 1 (Typical House with 2 Rooms and Verandah), Design Example 2 (100' x 60', 3-Storey Commercial Building), Practice Examples, References
5	Analysis and Design of Two-way Slab System without Beams (Flat Plates and Flat Slabs)	<b>Session – I:</b> Flexural Analysis of Two-Way Slab System without Beams (Direct Design Method) (Background, Introduction to Direct Design Method (DDM), Frame Analysis Steps using Direct Design Method (DDM), Example 1, Two Way Slabs (Other Requirements of ACI), Example 2, Example 3, Summary of Direct Design Method) <b>Session – II:</b> Shear Design for Two-Way Slab System without Beams (Flat Plates and Flat Slabs) (Introduction, Various Design Options, Design Example)
6	Introduction to Earthquake Resistant Design of Reinforced Concrete Structures	Introduction to Earthquakes and Its Effects on Buildings, Earthquake Design Philosophy, Seismic Loading Criteria, Example 1 (Static Lateral Load Procedure), Gravity vs. Earthquake Loading in RC Buildings, ACI Special Provisions for Seismic Design, ACI Provisions for Special Moment Resisting Frames (SMRF), ACI Provisions for Intermediate Moment Resisting Frames (IMRF), Miscellaneous Considerations, Design Example 2 (SMRF), Design Example 3 (SMRF)
7	Introduction to Prestressed Concrete	Introduction, Principle of Prestressing, Advantages of Prestressed Concrete, Prestressing Steel, High Strength Concrete used for Prestressed Construction, Methods of Prestressing
8	Introduction to Bridge Engineering	Introduction, Bridge Components, Types of Bridges, Loads for Bridge Design, Analysis & Design of Simply Supported RC Slab Bridges, Design Steps for Simply Supported RC Slab Bridge, Example, Famous Bridges in the World
9	Design of RC Retaining Walls	Retaining Walls, Terms Related to Retaining Walls, Types of Retaining Walls, Soil Parameters, Earth Pressure for Normal Conditions of Loadings, Retaining Wall Failure, Drainage and Other Details, Design of Cantilever Retaining Wall: Example
10	Miscellaneous Topics	Design of Biaxial columns, Design of RC Members for Torsion, Stairs, Two way joist system (Waffle Slabs)