

COURSE SYLLABUS

ADVANCED REINFORCED CONCRETE STRUCTURES

1- Advanced design of reinforced concrete slabs

- i. Strip method
- ii. Yield line method

2- Advanced design for shear in beams

- i. Shear friction
- ii. Horizontal shear transfer and composite concrete beams
- iii. Design of shear walls
- iv. Strut-and-tie model
- v. Truss model
- vi. Deep beams
- vii. Bearing & Shear walls
- viii. Corbels

3- Design for earthquake resistance

- i. Effect of confining the concrete and introducing famous models
- ii. Flexural hinges and their lengths
- iii. Ultimate deformation and ductility of members with flexure
- iv. Moment-curvature relationships
- v. Cyclic behavior of beam-column members
- vi. Redistribution of moments in reinforced concrete beams
- vii. Design of beam-column joints

4- An introduction to unified analysis of reinforced concrete structures

- i. Strut-and-tie model
- ii. Equilibrium (plasticity) truss model
- iii. Bernoulli compatibility truss model
- iv. Mohr compatibility truss model
- v. Softened truss model

5- Structural modeling of RC systems

6- Deformation of uncracked & cracked RC sections

- i. Creep and shrinkage
- ii. temperature

7- Special topics:

- i. Arches
- ii. Special types of frames and trusses
- iii. Folded plate roofs
- iv. Arched slab systems
- v. Silos
- vi. Cooling towers

8- Introduction to prestressed concrete

- i. Flexure in prestressed concrete beams