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