1. **Course number and name**
   ENGR 425: Reinforced Concrete Structures

2. **Credits and contact hours**
   3 credit hours; three 50-minute lecture sessions/week, or two 1-hr-15-minute lecture sessions/week, depending on semester

3. **Instructor’s or course coordinator’s name**
   Instructor: Zhaoshuo Jiang, Professor of Civil Engineering
   Course coordinator: Zhaoshuo Jiang, Professor of Civil Engineering

4. **Text book, title, author, and year**

   *a. other supplemental materials*
   PCA Notes on ACI 318-08 Building Code Requirements for Structural Concrete, Portland Cement Association, Skokie, IL, 2008.

5. **Specific course information**
   *a. brief description of the content of the course (catalog description)*

   *b. prerequisites or co-requisites*
   ENGR 323: Structural Analysis

   *c. indicate whether a required, elective, or selected elective course in the program*
   Elective for Civil Engineering
6. **Specific goals for the course**
   
a. *specific outcomes of instruction, ex. The student will be able to explain the significance of current research about a particular topic.*

   - The student will demonstrate a knowledge of mechanics of reinforced concrete.
   - The student will demonstrate a knowledge of reinforced concrete behavior when subjected to bending, axial load and torsion.
   - The student will demonstrate a knowledge of whether optimum design has been achieved.
   - The student will demonstrate a knowledge of design procedures for reinforced concrete structures.
   - The student will demonstrate a knowledge of the design method: Ultimate Design Method. The student will demonstrate knowledge of the design of columns.
   - The student will demonstrate knowledge of the design of beams.
   - The student will demonstrate a knowledge of the design of reinforced concrete slabs.
   - The student will demonstrate a knowledge of the design of footings.
   - The student will demonstrate skill in solving practical engineering problems through project assignments.
   - The student will demonstrate an understanding of the design building codes and the background of codes.
   - The student will demonstrate skill in applying codes and specifications to design reinforced concrete structural members.

   *b. explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course.*

   Course addresses ABET Student Outcome(s): a, c, e, i, k.

7. **Brief list of topics to be covered**
   
   - Footings
   - Structural Design Process and Principles.
   - Structural Load Paths
   - Reinforced Concrete Behaviors and Properties.
   - Flexure: Beams
   - Flexure: T Beams
   - Shear in Beams
   - Development, Anchorage, and Splicing of Reinforcement
   - Serviceability
   - Continuous Beams
   - One-way Slabs
   - Columns: Combined Axial Load and Bending
   - Slender Columns
   - Footings
   - Professional Software: S-Frame Suite