1. **Course number and name**
   ENGR 323: Structural Analysis

2. **Credits and contact hours**
   3 credit hours; two 1-hr-15-minute lecture sessions/week

3. **Instructor's or course coordinator's name**
   Instructor: Cheng Chen, Instructor
   Course coordinator: Cheng Chen, Assistant Professor of Civil Engineering

4. **Text book, title, author, and year**
   a. **other supplemental materials**
      (none)

5. **Specific course information**
   a. **brief description of the content of the course (catalog description)**
      Structural engineering, including standards and codes. Determination of loads, discussion of load path. Analysis of statically determinate structures. Forces within statically indeterminate structures. Structural analysis software.
   b. **prerequisites or co-requisites**
   c. **indicate whether a required, elective, or selected elective course in the program**
      Required 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.**
      - Student is aware of the major phases of the structural engineering project.
      - Student is aware of ASCE Standard 7 and the UBC/IBC.
      - Student can obtain loads on structures using ASCE Standard 7.
      - Student can determine the load path through common structures.
      - Student recognizes when a structure is unstable and how to make it stable.
      - Student recognizes when a structure is indeterminate and the number of degrees.
      - Student is able to compute internal forces in beams and readily construct shear and moment diagrams.
      - Student is able to compute bar forces in trusses.
      - Student can use classical methods for computing deflections, such as, moment-area method and virtual work.
      - Student can apply the method of consistent deformations for solving statically indeterminate trusses, beam and frames.
• Student can apply the method of moment distribution to solve statically indeterminate beams and frames.
• Student can make qualitatively correct sketches of deflections and moment diagrams for statically determinate beams and frames.
• Student can make qualitatively correct sketches of deflections and moment.
• Student is able to use a computer program (selected by instructor) to model and to solve problems similar to problems done “by hand.”
• Students are able to work effectively in teams.

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): c, d, e, f, i, k,

7. Brief list of topics to be covered
• Introduction to structures and loads.
• Static determinacy and indeterminacy.
• Stable and unstable planar structures.
• Reactions for planar structures.
• Forces in statically determinate trusses.
• Forces in statically determinate beams and frames.
• Deflections in statically determinate trusses.
• Deflections in statically determinate beams and frames.
• Forces in statically indeterminate trusses.
• Forces in statically indeterminate beams and frames.
• Deflections in statically indeterminate trusses.
• Deflections in statically indeterminate beams and frames.
• Forces and deflections using computer software SAP2000.