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, Associate Professor of Civil Engineering

   Course coordinator: Cheng Chen, Associate Professor of Civil Engineering

4. *Text book, title, author, and year*
   Hibbeler, R.C., Structural Analysis, 9th Edition, Person Prentice Hall, NJ, (2014)
   Or

   Hibbeler, R.C., Structural Analysis, SFSU Edition, Person Prentice Hall, NJ
   ISBN: 1323572287; 9781323572283

   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*
      ENGR 309: Mechanics of Solids.

   c. *indicate whether a required, elective, or selected elective course in the program*
      Required for Civil Engineering.

6. *Specific goals for the course*
   - *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.

a. 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.