1. **Course number and name**  
   **ENGR 439: Construction Engineering**

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

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

4. **Text book, title, author, and year**  
   
   a. **other supplemental materials**  
      (Latest Edition)

5. **Specific course information**  
   a. **brief description of the content of the course (catalog description)**  
      Topics in construction engineering; construction methods and equipment, excavating, loading, hauling, and finishing; production of construction materials; compressed air and water systems; concrete form design; building construction; construction safety.

   b. **prerequisites or co-requisites**  
      ENGR 309: Mechanics of Solids  
      ENGR 430: Soil Mechanics

   c. **indicate whether a required, elective, or selected elective course in the program**  
      Elective in 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 an understanding of the characteristics of the construction industry.  
      - The students will demonstrate an understanding of engineering ethics and professionalism.  
      - The student will show familiarity with certain current issues being debated by the construction community.  
      - The student will demonstrate an understanding of soil properties and Characteristics.  
      - The student will demonstrate the ability to calculate production rates of various construction equipment.
The student will demonstrate an understanding of QC/QA and the application of acceptance plans in construction projects.

The student will demonstrate an understanding of commonly used construction materials and equipment, and the ability to design certain construction systems.

The student will demonstrate understanding of the contractual relationships in construction and some legal aspects.

The student will demonstrate an understanding of, and appreciation for safety and safety programs in construction.

The student will conduct research on one aspect of construction engineering and management of his/her choosing and be ready to present the findings to the class.

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, j.

7. Brief list of topics to be covered

- Characteristics of the construction industry
- Earthmoving materials and operations
- Excavating equipment
- Loading and hauling equipment
- Cranes and lifting equipment
- Miscellaneous construction equipment
- Air and water systems
- Building construction systems
- Concrete mix design
- Concrete form design
- Construction safety
- Quality control