ABET course syllabus (Foundation Engineering)

1. Course number and name
   0901331: Foundation Engineering

2. Credits and contact hours
   3 Credit Hours

3. Instructor’s or course coordinator’s name
   Instructor: Wassel AL Bodour, Assistant Professor of Civil Engineering
   Course Coordinator: Wassel AL Bodour, Assistant Professor of Civil Engineering

4. Text book, title, author, and year
   a. other supplemental materials

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

   b. prerequisites or co-requisites
      Prerequisite: Geotechnical Engineering (0901232)

   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.
      - The student will be able to describe the process of subsurface exploration.
      - Student will be able to analyze shallow foundations on clay or sand that satisfy the allowable bearing capacity and settlement requirements based on soil properties
      - Student will be able to analyze single piles and pile groups that satisfy the bearing capacity and settlement requirements;
      - Student will be able to analyze lateral earth pressure
      - Student will be able to design foundations on expansive soils
      - Student will be able to evaluate stability of slopes
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, and e

7. Brief list of topics to be covered

- Introduction
  - Soil mechanics review
  - Subsurface exploration
- Bearing capacity of Shallow foundations on soils
  - Spread footing
  - Continuous wall footing
  - Strip footing
  - Mat foundation
- Bearing capacity of Foundation on rock
- Settlement of shallow foundations
  - Theory of Elasticity
  - Schmertmann method
  - Consolidation and preloading
  - Rock settlement
- Deep foundations
  - Geotechnical capacity of driven piles
  - Settlement of driven piles
  - Geotechnical design of driven piles
- Lateral earth pressure
  - Geostatic earth pressure
  - Active earth pressure
  - Passive earth pressure
  - Rankine’s theory
  - Coulomb’ method
  - Retaining walls
  - Sizing earth retaining walls
- Foundation on expansive soils
  - Expansive soils definitions and identification
  - Shallow foundations for expansive soils
  - Deep foundations for expansive soils
  - Negative skin friction
- Slope stability analysis
  - Limit equilibrium concept
  - Moment method
  - Method of slices: Ordinary /Fellenius method