

ABET course syllabus (Earth Retaining Structures)

1. *Course number and name*

0901431: Earth Retaining Structures

2. *Credits and contact hours*

3 Credit Hours

3. *Instructor's or course coordinator's name*

Instructor: *Bashar Tarawneh*, Associate Professor of Civil Engineering

Course Coordinator: *Bashar Tarawneh*, Associate Professor of Civil Engineering

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

- “Principles of Foundation Engineering”, Braja M. Das, 7th Edition, SI Edition, , 2011, Cengage Learning ,Stamford, CT 06902, USA
- “ Foundation Analysis and Design”, Joseph E. Bowles, , 5th Edition, 2001, McGraw Hill

a. *other supplemental materials*

- “ Soil Mechanics Principles and Practice”, Graham E. Barnes, 3rd Edition, 2010, Palgrave Macmillan

5. Specific course information

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

Review of fundamentals, lateral earth pressure, retaining walls, sheet-pile walls, cantilever sheet-pile walls, anchored sheet-pile walls, braced-excavation, reinforced earth, retaining walls with metallic strip reinforcement, retaining walls with metallic geotextile, gabions.

b. *prerequisites or co-requisites*

Prerequisite: Foundation Engineering (0901331)

c. *indicate whether a required, elective, or selected elective (as per Table 5-1) 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.*

- Student will be able to describe the main concepts related with the behavior of flexible earth retaining structures.
- Student will be able to identify the appropriated methods of analysis and design and to select the adequate constructive solutions.

- Student will be able to calculate and to develop structural solutions for different scenarios, relying on the current National and European structural codes. To draw structural solutions that illustrates the obtained design.
- Student will be able to discuss and compare different structural solutions, taking into account site constraints.
- Student will be able to consider and to formulate solutions on the basis of alternative quality criteria and construction sustainability.
- Student will be able to criticize solutions and to recommend new proposals that overcome shortcomings or present advantages.

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, and k

7. *Brief list of topics to be covered*

- Introduction
 - Soil mechanics review
 - Concept off earth retaining structures
- Lateral earth pressure
 - At-rest-condition earth pressure
 - Active earth pressure
 - Passive earth pressure
- Retaining Walls
 - Rankine's theory
 - Coulomb's method
 - Gravity retaining walls
 - Cantilever retaining wall
 - Sizing retaining walls
- Sheet-pile walls
 - Cantilever sheet pile wall
 - Anchored sheet pile wall
- Braced excavations
- Mechanically stabilized earth retaining walls (MSEW)
 - Metallic strip reinforcement
 - Metallic Geotextiles
- Gabion walls