Course Name: Earth Retaining Structures

Course Number: 20025	**Credit:** 3
Program: Undergraduate	**Course Type:** Technical elective
Prerequisite: Foundation Engineering	**Corequisite:** -

Course Description (Objectives):
Understanding the mechanisms of the performance of earth retaining structures such as rigid / flexible walls and deep excavations and describing their design procedures

Course Content (outline):

- **Chapter 1**- General

  - Types of Earth Retaining Structures and their Applications
  - Various Pressures applied to Retaining Structure (Earth, Water, Surcharge, Earthquake)
  - General Procedure for Analysis and Design of Retaining Structures

- **Chapter 2**- Rigid Retaining Walls

  - Gravity Retaining Walls
  - Cantilever Retaining Walls

- **Chapter 3**- Flexible Retaining Walls

  - Cantilever Sheet Pile Wall
  - Anchored Sheet Pile walls

- **Chapter 4**- Reinforced Soil Walls / Mechanically Stabilized Earth (MSE) Walls

  - Metal Stripes MSE walls
  - Geotextiles MSE walls
  - Geogrids MSE walls
  - Gabion Walls

- **Chapter 5**- Stabilizing Deep Excavations

  - Soil Nailing
  - Soil anchoring (tie-backs)
  - Pile Walls (Tangent, Secant, Intermittent)

- **Chapter 6**- Braced Cuts

  - Strutted Excavations
  - Cofferdams

- **Chapter 7**- Dewatering and Seepage Control

  - Excavation Dewatering
  - Seepage Control

References:

- Das, B.M. (2010): Principles of Foundation Engineering, 7th Edition, PWS-KENT
- Bowles, J.E. (1995): Foundation Analysis and Design, 5th Edition, Mac-Graw Hill
- Budhu, M. (2008): Foundations and Earth Structures, John Wiley & Sons
- Clayton, C.R.I., Woods, R.I., Bond, A.G., Milititsky, J. (2013): Earth Pressure and Earth Retaining Structures, CRC Press
- FHWA (2008): Earth Retaining Structures, Reference Manual, NHI-07-07 Publication
- FHWA (2015): Soil Nail Walls, Reference Manual, NHI-14-007 Publication
- FHWA (2013): Ground Anchors and Anchored Wall Systems, Geotechnical Engineering Circular No.4
- FHWA (1997): Earth Retaining Structures, Geotechnical Engineering Circular No.2

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