



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:



Department of Civil Engineering

- **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 (١٩٩٧): Earth Retaining Structures, Geotechnical Engineering Circular No.2**