



**Course Name:**

Unsaturated Soil Mechanics

<b>Course Number:</b> -	<b>Credit:</b> 3
<b>Program:</b> Graduate	<b>Course Type:</b> Technical Selective
<b>Prerequisite:</b> -	<b>Corequisite:</b> -

**Course Description (Objectives):**

This course aims to familiarize students with the general behavior and characteristics of the unsaturated soils. Also, the mechanical fundamentals of such soils and their applications in various engineering problems, as well as their mechanical differences with that of saturated soils, will be properly introduced

**Course Content (outline):**

- Chapter 1: Classification of Saturated and Unsaturated Soil Mechanics
- Chapter 2: Basic Physics and Phases in Unsaturated Soils
- Chapter 3: Stress State Variables and Stress Analysis
- Chapter 4: Measurement of Soil Suction
- Chapter 5: Flow Laws for Water and Air Phases
- Chapter 6: Permeability Measurement
- Chapter 7: Steady-State and Transient Flows
- Chapter 8: Theory and Measurement of Shear Strength, Shear Stiffness, and Damping
- Chapter 9: Plasticity Analysis and Limit Equilibrium
- Chapter 10: Behavioral Models of Unsaturated Soils
- Chapter 11: Relatively New Topics in Unsaturated Soil Mechanics

**References:**

- Fredlund, D.G. and Rahardjo, H. (1993), Soil Mechanics for Unsaturated Soils, John Wiley & Sons
- Fredlund, D.G., Rahardjo, H. and Fredlund, D.M. (2012), Unsaturated Soil Mechanics in Engineering Practice, John Wiley & Sons
- Blight, G. (2017), Unsaturated Soil Mechanics in Geotechnical Practice, Taylor & Francis
- Ng, C.W.W., Leung, A.K. and Ni, J. (2018), Plant-Soil slope Interaction, Taylor & Francis