

**Course Name:**

Advanced Soil Mechanics (II)

**Course Number:**

20416

**Credit:**

3

**Course Content (outline):**

1. Introduction
2. Continuum Mechanics: Concepts & Basic Equations of Stress & Strain
3. Stress & Strain Paths and Invariants
4. Nonlinear Behavior
5. Elasticity
6. Hypo-elasticity
7. Quasilinear Models
8. Plasticity, Introduction (Original Concepts & General Laws)
9. Plasticity Models (Mohr Coulomb, Drucker Pruger, Cam Clay, Cap Models)
10. Recent Developments (Hypo-plasticity, Nested Surface Models, Bounding Surface Models...)
11. Applications for Design

**References:**

- “Theory & Problems of Continuum Mechanics”, G.E. Mase, Schaum’s Series, 1970
- “The Mechanics of Soils – An Introduction to Critical State Soil Mechanics”, J.H. Atkinson & P.L. Bransby, McGraw Hill, 1978
- “Constitutive Laws for Engineering Materials, with Emphasis on Geologic Materials”, C.S. Desai & H.J. Siriwardan, Prentice- Hall, 1984
- “Soil Behavior and Critical State Soil Mechanics”, D.Muir Wood, Cambridge Univ. Press, 1990
- “Nonlinear Analysis in Soil Mechanics, Theory & Implementation”, W.F. Chen & E. Mizuno, Elsevier, 1990
- “Soil Plasticity: Theory & Implementation”, W.F. Chen & G.Y. Baladi, Elsevier, 1985
- “Rheological Fundamentals of Soil Mechanics”, S.S. Vyalov, Elsevier, 1986
- “Modern Approaches to Plasticity”, D. Kolymbas, Elsevier, 1993