

## Course syllabus

Department of Civil Engineering, Indian Institute of Technology Madras

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### CE5310 - Advanced Soil Mechanics

**Credit Distribution:** C:12 L:4 T:0 P:0 E:0 O:8 TH:0

**Course Type:** Theory

**Description:** Enable the learners to understand fundamental behaviour of soils.

**Course Content:** "Origin and formation of soils; Clay mineralogy and its role in fundamental soil behavior", "Soil aggregate; Classification system; Phase Relationships", "Principle of effective stress; Capillarity in soils, Shear strength of soils; Concepts of critical state soil mechanics", "Permeability; Steady state flow; Seepage; Flow nets; Design of filters", "Compaction characteristics of soils", "Transient Flow: One dimensional & generalized consolidation theories; Primary & secondary consolidation settlements; Corrections to 1-dimensional consolidation settlements and Stress path method for settlement computations".

#### Text Books

- Budhu, M. (2015). "Soil Mechanics Fundamentals", John Wiley & Sons Inc., New York, USA.
- Holtz, R.D., Kovacs, W.D. and Sheahan, T. C. (2015). An Introduction to Geotechnical Engineering, Prentice Hall, New Jersey, USA.
- Knappett, J.A. and Craig, R.F. (2012). Craigs Soil Mechanics, Spon Press, Abingdon, UK.
- Budhu, M. (2010). "Soil Mechanics and Foundations", John Wiley & Sons Inc., New York, USA.
- Ranjan, G. and Rao, A.S.R. (2008). Basic and Applied Soil Mechanics, New Age International Publishers, New Delhi, India.
- Mitchell, J.K. and Soga, K. (2005). Fundamentals of Soil Behaviour, John Wiley & Sons Inc., New York.
- Terzaghi, K., Peck, R.B. and Mesri, G. (1996). Soil Mechanics in Engineering Practice John Wiley & Sons, Inc., New York, USA.
- Das, B.M. and Khaled S. (2014). Principles of Geotechnical Engineering, Cengage Learning, Stamford, USA.

**Reference Books:** NIL

**Prerequisite:** NIL