

Carleton University
The Department of Civil and Environmental Engineering
CIVE 3208 (ERTH 4107): Geotechnical Mechanics
Tentative Outline

Lect./Lab
3 3/2 (Hours per week)

COURSE INSTRUCTOR: Dr. Mohammad Rayhani, P.Eng.
(CB 4206, Mohammad.Rayhani@carleton.ca)

LECTURES (Live): Monday/Wednesday ZOOM 10:05-11:25 AM

LABORATORY: Civil Engineering Laboratory, Minto Centre (Room: 1060)

TEACHING ASSISTANT:
- TBA

COURSE TEXT:

Das, Braja M., *Fundamentals of Geotechnical Engineering*, 4th edition, Brooks/Cole.

The lab handouts and lecture notes will be available on CuLearn before class.

Laboratory attendance and satisfactory submittal of all Lab reports are compulsory. Missing Labs or failure to submit Lab reports will lead to a grade of FND in the course.

REFERENCE TEXTS:

- (1) Coduto, D., *Geotechnical Engineering: Principles and Practices*, 2nd edition, Prentice-Hall.
- (2) Budhu, M., *Soil Mechanics and Foundations*, 3rd Ed., John Wiley & Sons, Inc.
- (3) Lambe, T.W. and Whitman, R.V., *Soil Mechanics*, John Wiley & Son Ltd.
- (4) Holtz, R.D. and W.D. Kovacs, *An Introduction to Geotechnical Engineering*, Prentice-Hall, Canada.

COURSE CONTENT

Topics	Reading (Braja M. Das)
Introduction: Scope, Methodology	
Origin and particle distribution of soils: residual and transported soils	Chapter 2

Phase relationships: mass and volume relationships in soil	Chapter 3
Fine-grained soil: Consistency and clay mineralogy.	2.12
Soil classification: Unified and AASHTO classification systems.	Chapter 4
Soil compaction: Standard & Modified Proctor tests; Field compaction.	Chapter 5
Flow of water through soil: Total, elevation & pressure heads, Darcy's law and the coefficient of permeability; Constant and falling head tests, Seepage, flow nets; Field permeability measurements.	Chapter 6, 7
Stresses in soils: Total, effective stresses & pore water pressure; Normal & shear stresses; Stress increment due to external load.	Chapter 8
Consolidation: Terzaghi's theory of one-dimensional consolidation; consolidation settlement and degree of consolidation.	Chapter 9
Shear strength of soils: Mohr-Coulomb failure criterion, cohesive vs cohesion-less materials, principal stresses, Laboratory shear tests.	Chapter 10

MARKING SCHEME*:

Assignments	10%
Laboratory Reports	20%
Mid Term	20%
Final Examination	50%

Note:

**To pass this course, one has to obtain at least 40% in the final examination.*

* The final examination is for evaluation purposes only and will not be returned to students.

* “The Paul Menton Centre for Students with Disabilities (PMC) provides services to students with Learning Disabilities (LD), psychiatric/mental health disabilities, Attention Deficit Hyperactivity Disorder (ADHD), Autism Spectrum Disorders (ASD), chronic medical conditions, and impairments in mobility, hearing, and vision. If you have a disability requiring academic accommodations in this course, please contact PMC at 613-520-6608 or pmc@carleton.ca for a formal evaluation. If you are already registered with the PMC, contact your PMC coordinator to send me your **Letter of Accommodation** at the beginning of the term, and no later than two weeks before the first in-class scheduled test or exam requiring accommodation (*if applicable*). **Requests made within two weeks will be reviewed on a case-by-case basis.** After requesting accommodation from PMC, meet with me to ensure accommodation arrangements are made. Please consult the PMC website (www.carleton.ca/pmc) for the deadline to request accommodations for the formally-scheduled exam (*if applicable*).”