

CIV 330 – Introduction to Geotechnical Engineering  
Spring 2021

**Current Catalog Description:** This course introduces students to the principles that govern the use and application of soil as an engineering material in civil engineering practice, and for students to gain proficiency in the classification and quantitative evaluation of soil engineering properties. The lectures and homework assignments will emphasize basic soil mechanics concepts using fundamental skills from engineering, science and mechanics courses.

**Prerequisite:** MEC 363; CIV, MEC or ESG major

**Corequisite:** CIV 341

**Textbooks and/or Other Req'd Matl:** An Introduction to Geotechnical Engineering by R. Holtz, W. Kovacs and T. Sheahan, Prentice Hall, 2nd Edition 978-0132496346.

**This course is:** Required

- Topics Covered:**
1. Original of soils and weight-volume relationships.
  2. Soil classification for engineering applications.
  3. Soil compaction.
  4. Flow of water through soils.
  5. Stresses in soil masses: Total, pore pressure, and effective stresses.
  6. Stresses in soil masses due to external loads: Foundations and Excavations.
  7. Consolidation of saturated clay deposits.
  8. Time rate of consolidation.
  9. Stresses in solid: Mohr's Circle.
  10. Shear strength of soils and Mohr-Coulomb failure criteria.

**Course Learning Outcomes/ Expected Performance Criteria:**

Course Learning Outcomes	ABET Student Outcomes
Explain what geotechnical engineering is and how important it is to civil engineering.	1
Classify soils for civil engineering applications.	7
Determine the specification for compacting soils in-situ.	1, 6
Estimate soil permeability and quantity of water seepage in soils.	6
Determine various stresses in soil masses including: naturally existing stresses (total, pore pressure, and effective), and externally induced stress changes due to foundations or excavations.	6, 7
Estimate the magnitude and time-rate of settlement due to consolidation.	6, 7
Determine normal and shear stresses at a point in a soil mass and use of Mohr-Coulomb failure criterion to evaluate possible failures.	6

Write clear technical memos.
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**Prepared by:** Ali Farhadzadeh (2021)