

Department of Engineering Technology & Surveying Engineering

Title and Course Number: Soil and Foundation Technology, ET 354

Meeting Time and Place: Lecture--T, TH 8:55-10:10, ECIII Room 242;
Lab--Mondays 2:30-5:00, ECIII Room 165

Credits and Contact Hours (Lecture/Laboratory): Lecture--3 hrs, Lab--2.5 hrs.

Course Description: Properties and applications of soils in engineering and construction.

Prerequisites: ET 240 and ET 254

Textbook: C. Liu and J. B. Evett, *Soils and Foundations*, Prentice Hall, New Jersey, 6th Ed.

Lab Book: C. Liu and J.B. Evett, *Soil Properties: Testing, Measurement, and Evaluation*, Prentice Hall, New Jersey, 5th Ed.

References: ASTM specifications, geotechnical journals, library and internet references

Course Coordinator: Sonya Cooper PhD., P.E., Rm 386, 646-3848, socooper@nmsu.edu.
Office hours: 3:00-4:00 T, W, TH, and by appointment.

Goals/Objectives: Specifically, this course is designed to aid the student in understanding basic soil mechanics by emphasizing soil characterization and mechanical properties using practical applications. The student that follows the requirements of this course as outlined in the syllabus will possess an understanding of the essentials of soil technology so that these concepts may be applied to design and construction management of soil foundations and reinforced earth design.

This Technical Science course will help achieve the goals of the overall civil engineering technology program outcomes by giving a measure of:

- an ability to interpret and/or prepare design and construction docs (measured by ability to interpret and/or prepare geotechnical reports, and foundation specifications and drawings) (ABET 3a, 3b, 9a)
- an ability to design and conduct experiments, as well as to analyze and interpret the data (measured by an ability to conduct standardized field and laboratory testing on soils and soil components) (ABET 3c, 9c)
- an ability to select and evaluate appropriate engineering materials and practices (measured by an ability to select and evaluate appropriate soils for embankment material, road subgrade material, backfill, foundations, adobe bricks, and MSE walls.) (ABET 9e)
- an ability to function on multi-disciplinary teams (ABET 3e)
- an ability to identify, formulate, and solve engineering problems (measured by an ability to apply basic technical concepts to solve soil mechanics problems) (ABET 3f, 9f)
- an ability to communicate effectively (measured by oral classroom participation and written lab reports) (ABET 3g)

Course topics and lecture hours devoted to each topic:

A. Soil Classification	1.5 hours
B. Soil Composition	1.5 hours
C. Soil Exploration	3 hours
D. Compaction	3 hours
E. Water in Soils	3 hours
F. Vertical Pressure on Soils	3 hours
G. Consolidation	1.5 hours
H. Settlement	1.5 hours
I. Shear Strength	3 hours
J. Shallow Foundations	3 hours
K. Piles	3 hours
L. Drilled Caissons	1.5 hours
M. Lateral Earth Pressures	3 hours
N. Braced Sheetings	1.5 hours
O. Retaining Structures	3 hours
P. Reinforced Earth Walls	3 hours
Q. Slope Stability Analysis	3 hours

Oral and Written Communication Requirements:

Each homework assignment must follow a logical format as indicated in the syllabus. Lab reports require strict format and content objectives. A final report is required to summarize findings from a design project.

Calculus Usage: 10% (Water in Soils)

Library Usage: Expected usage--1-2 hours per week to satisfy lab requirements.

COURSE GRADE:

The final course letter grade will be based on performance in the following area with approximate weights as indicated:

Class participation--41 @ 10	= 410 points
Homework--25 @ 20	= 500 points
Lab Reports--8 @ 50 points	= 400 points
Design Project	= 200 points
Tests--3 @ 100	= <u>300 points</u>
TOTAL	=1810 points