

Background

As a geotechnical engineer your involvement in a project will begin in the preliminary phase. Subsurface investigations are performed prior to any design in order to understand the soil conditions at the site. Upon completion of the subsurface investigation you will propose recommendations for foundations at the site and during construction you will perform quality inspections of the foundations.

Your Task

Work in groups of 3; groups will be chosen by the Professor. Each group will choose one of the five projects listed on OpenLab, <http://openlab.citytech.cuny.edu>. The assignment is divided into stages and each group will post their progress on OpenLab and present a summary to the class.

Plan a site visit with your group and research the site using websites such as google maps and oasis to determine the site area and any nearby subways or waterways. Develop a subsurface investigation for the site in accordance with the New York City Building Code (Building Code) requirements. Upon receipt of your soil samples, classify the soil samples in accordance with the Building Code perform laboratory tests including, moisture content determination, sieve analysis, hydrometer analysis, atterberg limits, permeability, unconfined compression, direct shear and compaction tests. Develop a soil profile and prepare recommendations for foundation design in accordance with the Building Code.

Process Stages for the Assignment

1. Research the site.
2. Perform a site visit.
3. Develop a subsurface investigation.
4. Perform Lab Testing.
5. Prepare a Soil Profile with design parameters for each soil layer.
6. Proposed foundation recommendation.
7. Submit final geotechnical report.

Learning Outcomes

- Knowledge
 - Pursue disciplined, inquiry-based learning in the major;
 - Show curiosity and the desire to learn;
 - Acquire tools for lifelong learning;

- Skills
 - Communicate in diverse settings using written, oral, and visual means;
 - Derive meaning from experience, as well as gather information from observation;
 - Employ scientific reasoning and logical thinking;
- Integration
 - Gather, interpret, evaluate, and apply information from a variety of sources;
- Values, Ethics, and Relationships
 - Demonstrate intellectual honesty and personal responsibility;
 - Transform information into knowledge, and knowledge into judgment and action;
 - Work with teams of diverse composition;

Format and Grading Criteria

Project is 60% of Final Grade. Each group must submit the following:

- Site Description (10pts)
- Proposed Subsurface Investigation (5pts)
- Soil Profile (20pts)
- Laboratory Reports (40pts)
- Final Geotechnical Report (25pts)

CMCE 2456
Soil Mechanics/Laboratory
Class Policies 2012
Professor Villatoro, P.E.



I. General

Course Name: Soil Mechanics

Course Number: CMCE2456

Days: Lecture Tuesday 2:00 - 3:40 pm; Rm V409
 Labs Thursdays 2:30 - 5:00 pm; Rm V409

Prof. Villatoro, P.E.

Office: Room V402

Office Hours: Posted

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II. Textbooks

- A. Essentials of Soil Mechanics and Foundations, Basic Geotechnics, by David McCarthy (7th edition)
- B. Soil Mechanics Laboratory Manual, by Braja M. Das (7th edition)

III. Topics of Importance

- A. Understanding of Soils – All Projects (Buildings, Bridges & Roads) start with a Geotechnical Evaluation.
- B. Inspection / Design – Understand Soils First
- C. Topics to be covered in this course:
 - 1. Soil Composition
 - 2. Identification/Classification
 - 3. Field Sampling/ Tests
 - 4. Strength
 - 5. Soil/Water Relationships
 - 6. Code Requirements
 - 7. Foundation Types
 - 8. Retaining Walls
 - 9. Soil Improvement
 - 10. Settlement/ Consolidation
 - 11. Lab Experiments

IV. Student Requirements

A. Grading

- Quizzes.....5@ 10 points each = 50 points 10% of final grade
- Project..... 60% of final grade
- Mid-Term – NICET test (as scored by NICET) 15% of final grade
- Final Exam.....4 parts@ 10 points each = 40 points 15% of final grade

B. Lab Reports

- **Lab Reports must be submitted at the Start of Class on the Due Date.** Submission of lab reports **after** the start of class will be marked late and down graded (*see late policy*)
- **Lab Reports must be complete – 100%**
- All reports will be graded according to the handout entitled “ What should be included in your report?” If sections of your report are missing you will get no points for the missing portion, please include all required items in every report to ensure the highest grade possible.
- **All reports must be typed.**
- Reports must be original works. Copying of any portion of a report will result in a grade of zero (0) for all parties involved. Data sheets may not be photocopied without my prior approval.
- Please make sure you have researched your conclusion by referencing your text, lab manual and/or reference CD. Note that the conclusion is the most important part of your report, it tells me whether you know what you are doing or not, please take a little time to think about what you are writing.
- Reports must be neat and professional.
- Remember to review your work after you write it and correct any obvious mistakes or grammar errors; don't lose points for silly mistakes.
- **Late Lab Reports**
- Late Reports will be down graded 1 point (out of the 10 possible points), for each week that passes after the due date, Lab Reports will not be accepted more than 2 weeks late.
- Submission of reports after the start of class will be marked late and down graded 1 point.

C. Exams

- Missed Quizzes can not be made up. Quizzes are at the start of class; be on-time. If you miss it, no make up will be given. If you start late you still need to hand it in with the rest of the class. The lowest quiz grade will be dropped.
- Missed Exams - No Make up Exams without a Very Good Reason (Emergency/Sick/etc.)
You must call my Office and speak to me; leave a message on my voice mail or send me an e mail the day of the Exam. If you do not contact me, no make up will be given and a Grade of ZERO (0) for the missed Exam. In all cases you should come to my office the First Day you return to class.

D. Attendance

- Missed Classes: College Policy – 3 Classes
- 3 Absences can result in a grade of “F”

- Please be on time! If you arrive late and the lab has already started you will be penalized on your lab report.
- If you have a problem, please come to my office ASAP to discuss it with me in Private.
- **If you are absent for a Lab, you will not be able to make it up.** You may not get the lab data from another member of the class. A missed lab will result in a zero grade for that lab.
- Missed Classes - It is your responsibility to contact me before the next class for any handouts. Missed classes do not absolve you from the **Due Date of a Lab Report**.

E. Homework

- Homework is assigned but not graded. It is your responsibility to do it, students who complete the homework typically do well on the quizzes. Don't wait until the quiz to find out to do the problems.
- In general, homework will not be gone over in detail in class. If you have questions about homework, please come to my office.

F. Blackboard - All class handouts and announcements will be posted to blackboard. It is your responsibility to check and download handouts before class. I will not be handing these out in class.

The skills you learn in this course should qualify you to get a summer internship as a soil boring inspector at a geotechnical design firm, or at a soil testing lab. **Especially if you pass the NICET certification test.**

V. CLASS SCHEDULE

Day	Date	Topic	Assignment
T	28-Aug	Introduction/ Soil Composition	
Thu	30-Aug	Phase Diagrams	
T	4-Sep	Index Properties & Classification Tests	
Thu	6-Sep	Introduction to Semester Project	Select Project Site
T	11-Sep	Subsurface Investigations, Quiz#1	
Thu	13-Sep	NYC Building Code	Post Site Research on OpenLab
T	18-Sep	College Closed-No Class	
Thu	20-Sep	Lab #1 Moisture Content and Sieve Analysis	Post photos from Site Visit
T	25-Sep	College Closed-No Class	
Thu	27-Sep	Lab #2 - Hydrometer Analysis	Post subsurface investigation
T	2-Oct	Soil Classification, Quiz #2	Report #1 Due
Thu	4-Oct	Lab #3 - Atterberg Limits (LL, PL)	

T	9-Oct	Seepage and Flow Nets	Report # 2 Due
Thu	11-Oct	Lab # 4 - Direct Shear and UC Test	
T	16-Oct	Soil Stress, Quiz #3	Report # 3 Due
Thu	18-Oct	Midterm	
T	23-Oct	Sufsurface Stresses	Report # 4 Due
Thu	25-Oct	Lab # 5 Permeability	
T	30-Oct	Post Construction Stresses	
Thu	1-Nov	Lab #6 Compaction	
T	6-Nov	Shear Strength Theory	Report # 5 Due
Thu	8-Nov	Soil Compaction	
T	13-Nov	Soil Compaction	Report # 6 Due
Thu	15-Nov	Quiz #4	
T	20-Nov	Ground Improvement	Post Soil Profile
Thu	22-Nov	College Closed-No Class	
T	27-Nov	Foundations	
Thu	29-Nov	Settlement / Sand	Post Foundation Recommendations
T	4-Dec	Settlement / Clay	
Thu	6-Dec	Lateral Earth Pressure/Retaining Walls	
T	11-Dec	Lateral Earth Pressure/Retaining Walls	Submit Final Geotechnical Report
Thu	13-Dec	Soils in Construction	
T	18-Dec	Review	
Thu	20-Dec	Final Exam	