

CE-342: Engineering Behavior of Soils and Foundations—Spring 2026

Instructor information

Luis Zambrano-Cruzatty, Ph.D.	
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When and where

Location	1231 Engineering Building 2
Day and time	Monday, Wednesday. Time 8:30 AM to 9:45 AM
Exam date	Monday, May 4. Time: 8:30 AM to 11:00 AM.
TA	Gaby Zaldivar Andrade (gazaldiv@ncsu.edu)
Drop In Help Sessions ¹	Monday and Wednesday: 1:00 PM to 2:00 PM
Dr. Zambrano-Cruzatty @ FWH 3181	Book a 15 min meeting using this link
Gaby Zaldivar Andrade @ Graduate Offices	Tuesday and Thursday: 9:00 AM to 10:00 AM
Prerequisite ²	C- or better in CE 225 and CE 282

¹ There will be occasions when I cannot keep these office hours (meetings, conferences, etc.), but I will try to keep you as informed as possible. If your question *requires only a brief answer*, you may send an email. However, due to other obligations, I may not be able to respond to your emails immediately. Additionally, emails received after 5:00 pm on weekdays or on weekends may not receive a response until the next business day. Generally, it is recommended to address questions during office hours and to use email communication only in exceptional cases.

² Prerequisites will be strictly enforced. If you do not satisfy the pre- and corequisites on the first day of class, you will be dropped from the course.

Course description

Description, identification, and engineering classification of soils. The basic principles and mechanics of flow of water through soils, deformation and strength of soils, and the processes of consolidation and compaction. Effective stress concepts, stress and settlement analyses, and evaluation of shear strength. Methods of analysis and geotechnical engineering design concepts.

Digital services, hardware, software

Moodle will serve as the learning management system for the course. All class handouts, homework, quizzes, grades, and communications will be hosted there.

This course may require specific technologies to complete the coursework. Be sure to review the syllabus for these expectations and consult the course [technology requirements](#). If you need access to additional technological support, please get in touch with the Libraries' Technology Lending Service: ([Technology Lending](#)).

Instructional Materials

The textbook is very helpful but not required for the course. The textbook is available for checkout through the NCSU Library for a few hours at a time if needed.

- Holtz, R. D., Kovacs, W. D., & Sheahan, T. C. (1981). An Introduction to Geotechnical Engineering. 3rd Edition, Pearson (2021).

Course objectives

The main objective of CE 342 is to introduce soil mechanics and foundation engineering to students in civil, environmental, and construction engineering. After taking this course, you will have the necessary background to pursue studies in geotechnical and geoenvironmental engineering.

1. Develop an understanding of soil phase relations, index properties, and their application to soil classification and compaction.
2. Develop an understanding of the importance of groundwater and seepage and their roles in evaluating effective stress in soils.
3. Develop an understanding of how to evaluate the stiffness and compressibility of soils and the impacts of seepage and permeability on time-dependent consolidation and settlement.
4. Develop an understanding of the stress state and shear strength of soils and their roles in the overall stability and strength of earthen systems (e.g., foundations and retaining walls).

Learning outcomes

After completing this course, you should be able to perform and interpret calculations and analyses that are essential in engineering practice.

1. Explain concepts related to soil fabric, formation, and mineralogy.
2. Classify soils for engineering purposes.
3. Calculate soil compaction parameters from laboratory and field measurement results.
4. Calculate total and effective stresses in soils, considering underground water seepage.
5. Assess the change in stresses due to imposed loads and determine the settlement and rate of settlement resulting from the consolidation of fine-grained soils.
6. Evaluate stress states and calculate stress-strain-strength parameters based on laboratory results.

Course assessment and structure

Homework and Quizzes	10%
Participation	4%
Midterm exams	36%
Midterm 1	18%
Midterm 2	18%
Final exam	30%
Laboratory	20%
Total	100%

Homework policies— (Late homework will not be accepted)

1. Homework will be assigned approximately once per week and will typically be due at the beginning of class one week from the assignment date.
2. Late assignments will not be accepted unless prior permission is granted or a valid medical excuse (with documentation) is provided.
3. You are encouraged to use any form of mathematical software (e.g., Python, Matlab, Excel, MathCad) to do your assignments. Homework completed in a clear, well-documented manner using the specified software will receive up to a 20% bonus per assignment. To better understand how extra credit is applied, refer to the extra credit policy in the *Additional Course Policies* section.
4. You will use Gradescope to submit your homework assignments online. **Use the entry code Soil&Rock to join** the course.

You can get instructions on how to access the course, submit your homework, and submit re-grade requests [here](#).

Having a high-quality scan is an important step in submitting assignments. The guide for students on obtaining a good scan is available [here](#).

Consider using the Gradescope app, Scannable, or another scanning app on your phone instead of taking photos, as it produces a much better scan. If you encounter any trouble submitting homework, logging in, etc., you can email help@gradescope.com. To ensure that your homework has been scanned and graded without issue, please retain the hard copy until your grade is posted in Gradescope.

5. Group work for homework assignments is encouraged. For example, meeting in groups of 2-4 students to resolve problems, ask questions, clarify ideas, or discuss approaches to solutions. However, **plagiarism is not allowed and will be referred to the Office of Student Conduct.**

You can submit homework as a group (no more than 4 students per group) or individually. If a student's name appears on a solution set, it certifies that he/she has participated in solving the problems and agrees with the academic integrity statement (see *Academic Integrity* section). Grades will be assigned to the group as a whole.

If the homework set contains more than 4 individuals listed, all group members will receive a score of 0 on the assignment.

6. Several questions in the assignment require arriving at a numerical answer. In such cases, I will provide the numerical answer you should arrive at. This will help you validate your solution, achieve a better grade, and ultimately identify recurring mistakes to learn from them. If you get stuck with any problem, do not waste time and go to Office Hours.

You might be tempted to use AI (e.g., ChatGPT, Gemini, etc) to resolve problems. Although the use of AI is not prohibited, you must be aware that these systems are not effective in resolving numerical problems. You could be misled, and even worse, you could assimilate incorrect concepts or ideas often generated by AI. Please refer to the *AI use policy* below for more information.

7. Homework Submission Requirements

All homework submissions must be accompanied by a **solution memo cover**. The memo serves two objectives:

- (a) Improve organization and accelerate grading.
- (b) Develop professional communication skills consistent with engineering practice.

Important: Each requirement listed below is mandatory. **Failure to meet any individual requirement will result in a 5-point (5%) deduction from the homework grade. Deductions are cumulative.**

a. Solution Memo Requirements

The homework must begin with a **solution memo** that includes the following elements **in the order listed**:

- **Recipient(s):** Dr. Luis Zambrano-Cruzatty and/or Gaby Zaldivar Andrade
- **Sender(s):** Your name or the names of all group members
- **Subject:** Example — “Solution of HMW 1”
- **Date of submission**

After the header fields, the memo must include:

- A professional salutation (e.g., “Dear Dr. Zambrano-Cruzatty,”)
- A brief body (usually no more than 1 page) summarizing:
 - The general approach used to solve the homework
 - Key results or conclusions (do not include detailed calculations)
- A professional closing that includes contact information
- A signed academic integrity statement at the end of the memo:

“I have neither given nor received unauthorized aid on this assignment.”

If you have not written a professional memo before, you may use the template provided [here](#).

b. Paper and Writing Requirements (Strictly Enforced)

- Use **engineering paper or white printer paper only**
- Write on **one side of the paper only**

- Use **pencil only**
- Submissions using notebook paper (“crinklies”) will **not** be graded

c. Organization and Layout

- Start each problem on a new page to improve clarity and grading efficiency
- Clearly define the problem statement and objectives at the beginning of each problem
- Fill out the title block on every page with:
 - Your name
 - Course number
 - Homework number
 - Date
 - Page number

d. Figures, Diagrams, and Neatness

- Use a straightedge for drawing neat, professional lines
- Draw figures and diagrams large enough to be easily readable
- All figures must be:
 - Clearly labeled
 - Referenced in the solution text
 - Accompanied by a brief explanation describing their purpose

e. Calculations and Final Answers

- Show all calculation steps clearly
- Include complete and consistent units at every step
- Final numerical answers must:
 - Be boxed
 - Include appropriate units
 - Be reported using **three significant figures**, unless otherwise specified

8. You (or your group members) must take responsibility for ensuring that the files you upload can be opened and read by the TA and Prof. Zambrano-Cruzatty. **If any of the files you submit cannot be opened for any reason, your homework will not be graded, and you will receive a grade of zero for that assignment.** This includes, but is not limited to:

- Files that are corrupt and cannot be opened.
- Submission of files with extensions or formats that cannot be read by the TA or the instructor’s operating systems.
- Files that require special packages, libraries, or dependencies that need to be installed in order to read them.

To prevent this situation from occurring, ensure your files are in PDF format.

Quizzes

1. Quizzes will be administered throughout the semester, typically during the last 20 minutes of class. They will be based on the material covered in previous classes, including homework and examples worked out in the text and in class.
2. No make-up quizzes will be given, but the lowest quiz grade will be dropped before determining the final quiz grade.
3. A few random unannounced pop quizzes may occur throughout the semester.
4. Answers will be collected using Top Hat (www.tophat.com), **so be sure to carry a charged phone, tablet, or laptop to participate.** If you do not have those with you, annotate your answers on a piece of paper with your name and submit it to Professor Zambrano-Cruzatty immediately after completing the quiz.
5. **Late submissions of hard copies will not be accepted.**

Participation Grading Policy

Class participation is used as a formative assessment tool to evaluate understanding of course material and to identify common misconceptions in Soil Mechanics.

1. During class, participation questions will be asked at selected points to assess comprehension of key concepts. These questions are intended to promote engagement and guide class discussion.
2. **Top Hat will be used for all in-class participation questions.** Students are responsible for bringing a charged phone, tablet, or laptop to class for this purpose.
3. Participation questions are graded on a **pass/fail basis**. As long as you submit a response through Top Hat, you will receive full participation credit for that question, regardless of whether your answer is correct.
4. Failure to respond to a participation question through Top Hat will result in a loss of participation credit for that question.
5. **Limited recovery of missed participation credit is possible by asking meaningful questions during class.**
 - This option is intended to accommodate occasional technical issues or isolated lapses in participation.
 - Asking questions does **not** replace Top Hat participation for missed classes or repeated non-participation.
 - Students must clearly state their names when asking a question so that participation credit can be recorded.
6. Justified absences will not affect your participation grade.
7. Participation grades are calculated at the end of the semester as the ratio of completed participation events. For example, a student who participated in 80% of the prompted questions will receive:

$$4 \times 0.80 = 3.2$$

for the *Participation* component of the course grade.

8. **No make-up participation quizzes or alternative participation opportunities will be administered.**

Midterm and Final Exams

1. The midterm and final exams are **in-person examinations**.
2. Each midterm exam will last 75 minutes. The final exam will last 150 minutes.

3. Equation Sheet Policy

You are allowed to bring one single-page, two-sided equation sheet to each exam. The following rules apply:

- (a) The equation sheet must be handwritten and prepared individually.
- (b) Copies of another student's equation sheet are not allowed.
- (c) Digital content, including screenshots, scanned material, or printed content, is not allowed.
- (d) You may include any material you find useful, such as equations, sketches, concept maps, examples, and notes.
- (e) You must attach your equation sheet, with your name clearly written, to your exam at the end of the exam period.

4. **Failure to adhere to the equation sheet policy will result in a 50% reduction of your exam grade.**

5. To solve the exams, you will need the following items:

- A calculator (non-phone, non-smart device)
- Ruler
- Compass
- Protractor

6. **Laptops, tablets, smartphones, smartwatches, and smart glasses are not permitted during exams.** These devices may not be used as calculator substitutes.

7. Students requiring electronic devices for accessibility accommodations must provide official documentation **prior to the exam** and receive approval through the appropriate university office (refer to the *Accommodations* section).

8. The scope of each exam will be discussed in class before the exam date. The final exam is comprehensive.

9. **Laboratory topics may be included in any exam.**

10. All tables, figures, and supplemental material required to solve exam problems will be provided with the exam. Additional instructions will appear on the exam itself.

11. Exam Review and Self-Markup Session

After each midterm exam, a review session will be held. During this session:

- Exam solutions will be discussed.
- Exams will be returned for self-markup.
- Students will assign themselves a preliminary grade.

The purpose of this session is to promote reflection, identify misconceptions, and support learning. Students also assist the instructor in the grading process.

Exams will be scanned prior to the review session.

12. The following policies apply during the self-markup session:

- (a) Students may **not** change or alter their original solutions. **Any modification constitutes a serious violation of Academic Integrity and will be referred to the Office of Student Conduct.**
- (b) Students must use a red or blue pen for markup.
- (c) Only students present at the review session may participate in self-markup.
- (d) No make-up review sessions will be offered.
- (e) No review session will be held for the final exam.
- (f) A 5-point extra credit will be added to the exam score for participation in the grading process. Details are provided in the Extra Credit Policy.
- (g) The self-assigned grade is preliminary and used for calibration purposes; **final grades are determined by the instructor.**

13. Final exam grades will be assigned by the instructor using GradeScope. Students whose self-assigned grade differs substantially from the instructor's grade may request a meeting to discuss the evaluation. Such meetings will not result in additional extra credit nor grade modification.

14. **Makeup Exam Policy**

Students who anticipate missing an exam due to a known conflict must notify Prof. Zambrano-Cruzatty in advance and provide appropriate documentation. Approved conflicts may result in a makeup exam administered prior to the scheduled exam date.

Justifiable conflicts include:

- University-sponsored athletic events
- Court appearances or legal obligations
- Medical or family emergencies

Since emergencies cannot be anticipated, students should notify the instructor as soon as possible and provide documentation when available.

Parties, weddings, vacations, and other social or family events are not considered valid justifications for missing an exam. In such cases, the missed exam grade will be redistributed to the remaining exams. For example, if Midterm 1 is missed, Midterm 2 will carry increased weight.

Laboratory

The laboratory component of this course operates under policies that may differ from those of the lecture component.

1. Homework, projects, quizzes, and examinations associated with the laboratory may follow grading and submission policies that differ from those used in lectures.
2. Laboratory safety policies will be introduced during lab sessions and must be strictly followed at all times.
3. **Closed-toed shoes are required to enter the laboratory.** Additional personal protective equipment and attire requirements may apply depending on the experiment.
4. Students who do not comply with laboratory safety requirements may be denied access to the lab and may receive a zero for the associated activity.
5. Detailed information regarding laboratory schedules, reports, presentations, quizzes, and the laboratory final exam will be provided by the teaching assistants. The laboratory syllabus and TA instructions are binding.
6. In case of conflict between lecture and lab policies, the lab syllabus governs laboratory grading.

Extra Credit Assignment — Optional

You may earn an additional drop on your lowest (non-exempt) quiz or homework grade by submitting a creative expression of your experience in this class. Examples include:

- A short video of an easy-to-replicate home experiment related to soil mechanics.
- A cool meme about one of the class subjects.
- An interactive game (e.g., computer or board game)

Syllabus Quiz — Strictly enforced

You are required to read the syllabus in full and complete a quiz to evaluate your understanding of course policies.

1. The quiz is hosted in Moodle. **Completion of the syllabus quiz with a score of at least 90% is required to remain enrolled in the course.**
2. You have infinite attempts to complete the Syllabus quiz.
3. **The quiz will be available only during the first week of class;** after that, it will not be accessible.
4. **No make-up opportunities for the Syllabus quiz will be available** after the due date.

Grading

The following grading scheme will apply to this course.

A+	above 97
A	93-97 ⁻
A-	90-93 ⁻
B+	87-90 ⁻
B	83-87 ⁻
B-	80-83 ⁻
C+	77-80 ⁻
C	73-77 ⁻
C-	70-73 ⁻
D+	67-70 ⁻
D	63-67 ⁻
D-	60-63 ⁻
F	below 60

⁻ indicates number is not included

Additional Course Policies

Extra Credit Policy

1. **Extra credit is not cumulative.** You cannot accumulate points for later use.
2. **Extra credit is not distributable.** You cannot transfer extra credit earned in one grade category to another.
3. **Extra credit is not transferable.** You cannot endorse your extra credit to another individual.
4. **All policies and rules stated above apply to excess extra credit.** Example: If you scored 97% on an exam with 5% extra credit, you will receive 100% as your score. The remaining 2% will be void.

Attendance¹

Full participation in classes is expected of all students. If you do not come to class having reviewed the assigned material, you will likely experience unnecessary difficulty in understanding the lectures, completing the assignments, and successfully passing the exams. **Refer to (NCSU REG 02.20.3)** at: <https://policies.ncsu.edu/regulation/reg-02-20-03-attendance-regulations>.

Class participation is encouraged and will be solicited. You will gain the most from this course if you are actively engaged and participate. If a student is absent from class (unless the absence is due to a medical or another justifiable reason with written documentation), they assume responsibility for making arrangements with a fellow student to obtain class notes.

¹Attendance language adapted from Dr. Meredith Martinez's CE 342.

Accommodations

Reasonable accommodations will be made for students with accessibility needs. In order to take advantage of available accommodations, students must register with Disability Resource Office at: Holmes Hall, Suite 304, 2751 Cates Avenue, Campus Box 7509, phone 919-515-7653, website: <https://dro.dasa.ncsu.edu>

For more information on NC State's policy regarding students with accessibility needs, please visit the following website: <http://policies.ncsu.edu/regulation/reg-02-20-01>.

Use of Generative Artificial Intelligence (AI)

This policy explains how you may and may not use artificial intelligence (AI) tools, (e.g., ChatGPT, Copilot, Gemini, Claude, GitHub Copilot, Copilot in Excel/Word, etc.) in this course. This policy is designed to:

- Support your learning and development of core engineering skills.
- Clarify what constitutes acceptable assistance vs. academic misconduct.
- Ensure fairness among all students.

This policy is based on the following general principles:

- You are ultimately responsible for all work you submit, regardless of whether you used AI tools.
- AI tools may be helpful for brainstorming, clarification, and feedback, but they cannot replace your own thinking and problem-solving.
- AI tools often produce incorrect, incomplete, or fabricated information. **You must critically validate any AI-generated content.**

1. Allowed Uses of AI (with Attribution)

Unless otherwise specified by the instructor for a particular assignment, you may use AI tools for the following purposes:

(a) Conceptual Understanding:

- Asking for explanations of course concepts (e.g., "Explain Terzaghi's consolidation theory in simple terms").
- Asking for alternative explanations or examples when you are stuck.
- Using AI to summarize or restate material already covered in lectures or the textbook.

(b) Writing Support

- Brainstorming ideas or outlines for reports, proposals, or reflections.
- Getting feedback on clarity, structure, or grammar of text you have already written.
- Rephrasing sentences for clarity or correctness while preserving your original meaning.

(c) Programming and computational tools (If applicable).

- Getting examples of syntax or language features (e.g., how a 'for' loop works in MATLAB or Python)

- Asking for explanations of general algorithms, data structures, or numerical methods.
- Asking for help understanding error messages or debugging strategies.

(d) Study Support

- Requesting high-level study plans or checklists based on course topics.

2. If you use AI in any of these allowed ways and the output meaningfully shapes your submission, you must acknowledge it. Example:

“I used ChatGPT (Jan 2026 version) to: (1) clarify the concept of total head, and (2) suggest grammar and wording edits to Section 2 of the memo. All engineering calculations, reasoning, and final wording choices are my own.”

You can attach a capture of the prompt question to your assignment sheet.

3. Prohibited Uses of AI

The following uses are **not allowed** in this course and will be treated as academic misconduct unless the assignment instructions explicitly allow them:

(a) Replacing Your Own Work

- Submitting AI-generated solutions to homework, lab reports, or projects, as if they were entirely your own.
- Using AI to directly complete problem sets (e.g., “Solve problem 3.7 and show all work” and then submitting that solution).
- Using AI to generate code, designs, or calculations and submitting them without substantial modification, understanding, and independent verification.

(b) Assessments Meant to Evaluate Individual Understanding

- Using AI tools in quizzes, exams, or any closed-book or in-class assessments, unless explicitly allowed by the instructor.

(c) Misrepresentation and Fabrication

- Asking AI to fabricate experimental data, measurements, or results for labs or projects.
- Asking AI to generate citations or references and not checking that they actually exist and are accurate.

(d) Circumventing Learning Objectives

- Using AI to produce design work, diagrams, or engineering justifications that you cannot personally explain.

4. Assignment-Specific Rules

The default rules above apply unless the instructor states otherwise. For certain assignments, one of the following policies may apply and will be clearly indicated in the instructions:

- **AI Prohibited:** You may not use AI at any stage of the assignment.
- **AI Limited:** You may use AI only for specific tasks (e.g., grammar checking) as stated by the instructor.

- **AI Allowed with Attribution:** You may use AI more broadly, but you must document and take responsibility for its contributions.
- **AI Collaborative/Exploratory:** Some activities may explicitly invite you to compare your work with AI-generated responses for learning purposes.

Always read assignment instructions carefully. If you are unsure whether a particular AI use is allowed, you must ask the instructor **before** using the tool.

5. Validation and Understanding

- You must independently verify all technical details, calculations, code, and references suggested by AI.
- You must be able to explain any part of your submission in your own words if asked (in writing or orally). Inability to do so may be treated as evidence of inappropriate AI use.

6. Data Privacy

- Do **not** upload or share proprietary, confidential, or sensitive information (e.g., solutions to unpublished assignments, exam questions, other students' work, or non-public research data) with public AI tools, especially on "free" platforms.
- As an NC State student, you can access various AI platforms with "pro" or "full" attributes that comply with University requirements for data privacy. Examples include Gemini and Notebook LM.

7. Evolving Nature of AI

AI technologies change rapidly. This policy may be updated during the term if needed. Any changes will be communicated clearly via Moodle and will apply only prospectively.

Academic Integrity²

Integrity is the foundation of successful engineering practice. Acting with integrity is essential for maintaining the health and wellbeing of the public as a civil engineer. **All aspects of your coursework are governed by the Code of Student Conduct.** Any suspected **violations of the Code of Student Conduct will be promptly reported to the Office of Student Conduct.** Honesty in your academic work will lead to professional integrity.

Students should refer to NC State's policy on academic integrity, which is found in the **Code of Student Conduct Policy (NCSU POL 11.35.1)** at <https://policies.ncsu.edu/policy/POL 11-35-01>, if they have any questions regarding the honor code. By signing each homework assignment and exam, the student attests to the following university policies.

Honor Pledge: *"I have not either given nor received unauthorized aid on this test or assignment."* Any actions against this honor pledge will be punished to the extent allowed by the University.

NC State requires that, if I suspect a violation of the Code of Student Conduct has occurred, I must report it to the Office of Student Conduct. If you suspect that a violation of the Code of Student Conduct has occurred, it is your responsibility to report it, and I recommend you report it directly to the OSC, which has procedures in place to protect reporters of suspected violations. Students found guilty of academic misconduct will receive, at a minimum, a zero on the assignment in question, up to a zero for that course component (e.g., a zero for the homework portion

²Academic integrity language adapted from Dr. Lisa Bullard's CHE 205 Syllabus

of the final grade), or a failing grade in the course, depending on the nature of the violation. **In addition, if you are found guilty of academic misconduct in the course, you will be on academic integrity probation for the remainder of your years at NC State**, may be required to report your violation on future professional school applications, and could have further implications for ROTC positions and/or employment on campus. It's not worth it!

It is the instructor's expectation and understanding that the student's signature on any test or assignment means that the student completed the assignment in question and that they neither gave nor received unauthorized aid. Authorized aid on an individual assignment includes discussing the interpretation of the problem statement, sharing ideas or approaches for solving the problem, and explaining the concepts involved.

Any other aid would be unauthorized and a violation of the academic integrity policy, including accessing homework from previous years. Unauthorized aid additionally includes accessing online solutions (e.g. via Chegg or others), whether that be posted copies of homework problems, paying someone to complete your homework, or the prohibited use of artificial intelligence (including but not limited to ChatGPT) as detailed in the *Use of Generative Artificial Intelligence Policy*.

Any computer work submitted must be completed on your own personal computer to avoid confusion about the origin of the file, and no sharing of files in any way is allowed. **Cheating on a homework assignment will result at maximum in a zero for your entire homework grade (10% of your final grade!).**

The documents – both electronic and hard copies of lecture notes, lecture videos, homework assignments and solutions, exams and solutions, or handouts –made available to you for this course are intended only for your personal use. You are not allowed to share any content of the class with any person not signed up for the course in this or a future semester; a personal, public, or commercial website; or any other news or advertising media.

Interactive Class Environment¹

Through this course, efforts will be made to keep the material relevant and applicable through interactive discussions and class participation. Your participation is appreciated and will enhance the overall learning experience.

In an effort to affirm and respect the identities of all students in the classroom and beyond, please contact me if you wish to be referred to using a name and/or pronouns other than what is listed in the student directory.

Non-Discriminatory Policy

NC State University provides equality of opportunity in education and employment for all students and employees. Accordingly, NC State affirms its commitment to maintain a work environment for all employees and an academic environment for all students that is free from all forms of discrimination. Discrimination based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation is a violation of state and federal law and/or NC State University policy and will not be tolerated. Harassment of any person (either in the form of quid pro quo or creation of a hostile environment) based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation also is a violation of state and federal law and/or NC State University policy and will not be tolerated. Retaliation against any person who complains about discrimination is also prohibited. NC State's policies and regulations covering discrimination, harassment, and retaliation may be accessed at <http://policies.ncsu.edu/regulation/reg-04-25-2> or http://www.ncsu.edu/equal_op/. Any person who feels that he or she has been the subject of prohibited discrimination, harassment, or retaliation should contact the Office for Equal Opportunity (OEO) at 919-515-3148.



Supporting Fellow Students in Distress

As members of the NC State Wolfpack community, we each share a personal responsibility to express concern for one another and to ensure that this classroom and the campus as a whole remains a safe environment for learning. Occasionally, you may come across a fellow classmate whose personal behavior concerns or worries you. When this is the case, I would encourage you to report this behavior to the NC State Students of Concern website: <http://studentsofconcern.ncsu.edu/>. Although you can report anonymously, it is preferred that you share your contact information so they can follow-up with you personally.

Instructor's Commitment

You can expect your instructor to be courteous, punctual, well-organized, and prepared for lectures and other class activities; to be available during office hours or to notify you in advance if they are unable to keep them; to provide a suitable guest lecturer when traveling; and to grade uniformly and consistently according to the posted guidelines.

Course Evaluation

Class evaluations will be available for students to complete during the last two weeks of classes. All evaluations are confidential; instructors will never know how any one student responded to any question, and students will never know the ratings for any particular instructor.

Evaluation website:	http://go.ncsu.edu/cesurvey
Student help desk:	classeval@ncsu.edu
More information about ClassEval:	https://oirp.ncsu.edu/surveys/classeval

Need Help?

If you find yourself in a place where you need help, academically or otherwise, please review these [Step-by-Step Help Topics](#).

Other Important Resources

Keep Learning:	keep learning
Campus Health:	Protect the Pack
NC State Protect the Pack Resources for Students:	Resources for students
Academic Success Center (tutoring, drop-in advising, career and wellness advising):	Academic Success Center
NC State Keep Learning, tips for students opting to take courses remotely:	Tips for Remote Learning
Introduction to Zoom for students:	https://www.youtube.com/watch?v=5LbPzzPbYEW
Learning with Moodle, a student's guide to using Moodle:	Learning with Moodle—Course
NC State Libraries:	Technology Lending Program

Tentative schedule

Course schedule disclaimer

In the event of an extended disruption of normal classroom activities, the format for this course may be modified to enable its completion within its programmed time frame. In that event, you will be provided an addendum to the syllabus that will supersede this version.

Lecture	Day	Date	Topic	Homework	Reading (based on 3rd edition)	Lab topic
1	M	01/12/2026	Introduction/ Soil formation/ History of soil mechanics		Ch. 1, 3.3, and App A	Week 1: Lab Introduction
2	W	01/14/2026	Phase Relationships		Ch. 2.1, 2.2	
	M	01/19/2026	No class: MLK Jr. Day	HM1 due (1/20/2026)		Week 2: No lab
3	W	01/21/2026	Grain size characteristics --- Quiz 1	HM2 due	Ch. 2.3-2.5	
4	M	01/26/2026	Atterberg Limits and soil classification		Ch. 2.6-2.9	Week 3: Visual Classification
5	W	01/28/2026	Soil Mineralogy and Structure/ Field investigations --- Quiz 2	HM3 due	Ch. 3.6-3.9, Ch. 8.7, Handout	
6	M	02/02/2026	Geostatic stresses: Pore pressure, total and effective stresses		Ch. 5.2, 5.9- 5.10	Week 4: Specific Gravity
7	W	02/04/2026	Geostatic stresses: At-rest horizontal stresses	HM4 due	Ch. 5.11	
8	M	02/09/2026	Fluid flow in soils: Total head, hydraulic gradient, and Darcy's law --- Quiz 3		Ch. 6.1-6.3	Week 5: Grain Size Distribution
9	W	02/11/2026	Fluid flow in soils: Soil permeability and equivalent permeability	HM5 due	Ch. 6.4	
10	M	02/16/2026	Fluid flow in soils: Seepage effects, internal erosion or "quicksand" effect		Ch. 6.5-6.6	Week 6: No lab (Wellness week)
11	W	02/18/2026	Stress Induced by Surface Loads --- Quiz 4	HM6 due	Handout	
12	M	02/23/2026	Compressibility and intro to consolidation		Ch. 7.1-7.4	Week 7: Atterberg Limits
13	W	02/25/2026	Primary consolidation settlement	HM7 due	Ch. 7.5, 7.7, 7.10	
14	M	03/02/2026	Time rate of consolidation --- Quiz 5		Ch. 7.12-7.15, 7.18	Week 8: Permeability test
15	W	03/04/2026	Compaction fundamentals	HM8 due	Ch. 4.1-4.5	
	M	03/09/2026	Midterm exam 1			Week 9: No lab
16	W	03/11/2026	Exam 1 Review (TA or substitute instructor)			
	M	03/16/2026	No class: Spring Break			Week 10: No lab (Spring break)
	W	03/18/2026	No class: Spring Break			
17	M	03/23/2026	Field compaction control		Ch. 4.6-4.8	Week 11: Consolidation
18	W	03/25/2026	Intro to State of Stress --- Quiz 6	HM9 due	Handout	
19	M	03/30/2026	Intro to Shear Strength		Ch. 8.1-8.4	Week 12: Compaction
20	W	04/01/2026	Measurement of shear strength --- Quiz 7	HM10 due	Ch. 8.5	
21	M	04/06/2026	Shear strength (continued)		Ch. 8.1-8.6	Week 13: Direct Shear
22	W	04/08/2026	Bearing Capacity of Shallow Foundations --- Quiz 8	HM11 due	Ch. 10.5-10.7	
23	M	04/13/2026	Bearing Capacity: Shallow Foundation Design		Ch. 10.8	Week 14: Final Project presentation
24	W	04/15/2026	Earth pressure: Active and Passive Pressures		Ch. 11.1-11.3, 11.5	
25	M	04/20/2026	Retaining Wall Analysis and Design --- Quiz 9	HM12 due	Ch. 11.6	Week 15: Lab final exam
	W	04/22/2026	Midterm exam 2			
26	M	04/27/2026	Last day of class: Exam 2 Review	Extra credit due		Week 16: Lab final exam
	M	05/04/2026	Final Exam (EB2 1231) (8:30 AM - 11:00 AM)			

M Monday
 W Wednesday
 No Class or No lab
 Exam/project due
 TA or substitute instructor