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Spring 2021

CE 443-102: Foundation Design

Matthew Riegel

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DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

CE 443-141 Foundation Design - Fall 2020

General Course Information

Instructors: **Matthew Riegel, PE, D GE**
 Office - 261 Wednesday, 3pm to 6pm and 9pm – 10pm (following class) and by appointment
e-mail: mdriegel@hntb.com 973-632-7541 (Cell)
 Outside office hours please contact me via e-mail or cell phone.

Text: Principles of Foundation Engineering 9th Ed. Das and Nagaratnam, 2019 Cengage Learning
 ISBN: 978-337-70502-8

6:00 pm – 8:50 pm Hybrid - Kupfrian Hall 203 - Thursday. January 21, 2021- May 13, 2021 Prerequisites: CE 341, CE 341A.

Week	Date	Topic
1	1-21	<i>In Class</i> - Review –Shear Strength and Consolidation; Geotechnical Investigations
2	1-28	<i>Remote</i> - Shear Strength and Bearing Capacity Theory
3	2-4	<i>In Class</i> - Application of Bearing Capacity Theory
4	2-11	<i>Remote</i> - Bearing Stresses and Elastic Settlement
5	2-18	<i>In Class</i> - Consolidation Settlement
6	2-25	<i>Remote</i> - Design of Shallow Foundations
7	3-4	<i>In Class</i> - Exam 1 followed by Introduction to Deep Foundations
8	3-11	<i>Remote</i> - Pile Foundations- Types and Installations
	3-18	No Class
9	4-1	<i>In Class</i> - Pile Capacity and Settlements
10	4-8	<i>Remote</i> - Design/Construction of Pile Groups
11	4-15	<i>In Class</i> - Design/Construction of Drilled Shafts
12	4-22	<i>In Class</i> - Exam 2 followed by Introduction to Lateral Earth Pressure
13	4-29	<i>Remote</i> - Lateral Earth Pressure and Retaining Wall Design
14	5-6	<i>In Class</i> - Design of Retaining Walls
15	5-13	<i>In Class</i> - Exam 3



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Attendance:

Attendance: Attendance and class participation are mandatory. If you are unable to attend instructor should be informed prior to the class. It is your responsibility to obtain the materials presented and submit homework as assigned on the date due. It is suggested you contact a fellow student to provide you with the materials missed.

Jan 18	Monday	Martin Luther King, Jr. Day
Jan 19	Tuesday	First Day of Classes
Jan 23	Saturday	Saturday Classes Begin
Jan 25	Monday	Last Day to Add/Drop a Class
Jan 25	Monday	Last Day for 100% Refund, Full or Partial Withdrawal
Jan 26	Tuesday	W Grades Posted for Course Withdrawals
Feb 2	Tuesday	Last Day for 90% Refund, Full or Partial Withd, No Refund for Partial Withd after this date
Feb 15	Monday	Last Day for 50% Refund, Full Withdrawal
Mar 8	Monday	Last Day for 25% Refund, Full Withdrawal
Mar 14	Sunday	Spring Recess Begins - No Classes Scheduled - University Open
Mar 21	Sunday	Spring Recess Ends
Apr 2	Friday	Good Friday - No Classes Scheduled - University Closed
Apr 5	Monday	Last Day to Withdraw
May 4	Tuesday	Friday Classes Meet
May 4	Tuesday	Last Day of Classes
May 5	Wednesday	Reading Day 1
May 6	Thursday	Reading Day 2
May 7	Friday	Final Exams Begin
May 13	Thursday	Final Exams End
May 15	Saturday	Final Grades Due
TBA		Commencement

Activities:

Students will be provided insights into the following foundation design topics –

- Soil strength, consolidation, and site investigation
- Selection of foundation types and basis for design
- Foundation loading
- Permissible settlements (service state) of shallow and deep foundations
- Stability (strength state) of shallow and deep foundations
- Slope stability
- Computations of earth pressure and design of retaining walls.

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Your overall grade will be based on the following:

- 20% Quizzes
- 10% Written Homework Assignments
- 70% 3 Exams (proctored by Respondus or Webex – Webcam needed)

The final grade will be as follows:

A	90-100
B+	86-89
B	80-85
C+	74-79
C	70-73
D	60-69
F	<59

All assignments will be collected on the due date prescribed; if you are absent it is your responsibility to submit the assignment on that date. Late homework will not be accepted. All work to be submitted at the start of class or in my mailbox, electronic uploads will not be accepted.

Mobile Phones must be turned off during class.

• **Electronic versions of homework must be a SCANNED PDF file with the file titled as follows:**

LAST NAME_Assignment No X.PDF

- Please keep a copy of all your work until you received a final grade.
- Please save a copy of your homework before submitting it to the instructor, since it may not be always possible for the instructor to return the corrected homework back in time for you to study for quizzes and examinations.
- All work should be done in a professional manner.
- Homework is due at the beginning of class. **Late homework will not be accepted.**
- The instructor may photocopy and save your assignments and tests, as part of the effort necessary to renew accreditation of our educational programs. The copies, which will be accessible only to faculty, administration, and external reviewers, will be destroyed afterwards.
- No make-up examination will be administered, unless approved by the Dean
- **Switch off cell phones during quizzes and examinations.**
- No recording devices shall be used during class or examinations. Take notes.

A quiz will be given each class based on each material covered in the previous class from 6:00-6:20 PM. There will be two questions: the first will be conceptual to evaluate theory of the material covered in the previous week; the second will be practical to apply theory and test comprehension. A missed quiz (due to absence or tardiness to class) will be assigned a grade of zero. A minimum passing grade of 70% for quizzes will be required to pass the course. Absence from 4 or more quizzes will result in a failing grade for the course.

All examinations open book, open notes.



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Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: <http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf>.

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at dos@njit.edu



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HOMEWORK

All homework assignments shall be submitted with a short Memorandum, generally of one to two (maximum) pages of text with accompanying figures, tables, drawings, calculations, etc. The memorandum should be typed (hand written submittals will not be accepted; however, handwritten calculations are acceptable). The following information shall be included:

1. Your name
2. Date
3. Course Title and Number
4. Person to whom it is being submitted.
5. A brief statement of the assignment purpose (what was requested, who authorized it and what you did).
6. Reference to any drawings, figures, charts etc. – identify and important information that they contain.
7. Description of what information was obtained and used to solve the problem.
8. Important results clearly identified.
9. Appropriate conclusions and recommendations.
10. All sources cited

Also include any list of symbols, figures or tables that you think are appropriate but do not obscure the important results with excessive computer output or calculation worksheets.

All calculations are to be included, all work shown and presented on engineering graph paper, handwritten calculations must be neat.