JOHN A. REIF, JR. DEPARTMENT OF
CIVIL AND ENVIRONMENTAL ENGINEERING
NJIT New Jersey Institute of Technology

CEE 414 – 002: Engineered Construction

(3 credits)

Lectures Friday, 2:30 pm – 5:20 pm
CKB 114

Instructor Chrissa D. Roessner, P.E.
Colton Hall
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Office Hours: Fridays 5:20 pm – 6 pm
Email professor for an appointment

Prerequisites CE 210, CE 332, CE 341

Required Textbook

Not applicable.

Other Recommended Texts & Reading

As posted in Canvas throughout the semester.

Course Description

Design, erection, and maintenance of temporary structures and procedures used to construct an engineering project. Business practices, codes, design philosophies, construction methods, hardware, inspection, safety, and cost as they pertain to engineered construction projects.

Course Objectives (General)
By the end of this course, the student will be able to:

1) Determine loading on temporary construction structures.
2) Design various types of supports and temporary structures.
3) Discuss and review construction safety practices for temporary structures.

POLICIES & PROCEDURES

Academic Integrity: It is expected that NJIT's University Code on Academic Integrity will be followed in all matters related to this course. Refer to NJIT's Dean of Students website to become familiar with the Code on Academic Integrity and how to avoid Code violations.

https://www.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf

Communication: All communication from the professor to the students will be through Canvas or campus email. The same is expected of the students when communicating with the professor. Weekly course announcements will be posted / emailed utilizing Canvas. Students are strongly encouraged to review these messages carefully.

Lectures/Class: Students are expected to attend every class session in-person, as scheduled. Attendance will be taken. Students are responsible for any missed work, and any absence resulting in missed work must be excused by the Dean of Students. The professor is not to be recorded on video or audio with prior notice and agreement.

Course Schedule:

Class Meeting Date	Topic	Assignments / Notes
01/24/2025	Introductions / Syllabus / Integrity Loads on Temporary Structures	
01/31/2025	Forms & Formwork Part I (Walls)	Homework #1 Assigned
02/07/2025	Forms & Formwork Part II (Walls)	Quiz #1 Homework #2 Assigned
02/14/2025	Forms & Formwork Part III (Slabs)	Quiz #2 Homework #3 Assigned
02/21/2025	Temporary Roads and Bridges Construction Safety & Best Practices	Quiz #3
02/28/2025	Midterm Review	
03/07/2025	Midterm Exam	
03/14/2025	Scaffolding	
03/21/2025	NO CLASS	Spring Break
03/28/2025	Sheet Piling Slopes, Excavations, Walls	Homework #4 Assigned
04/04/2025	Coffer Dams & Dewatering Underpinning	Quiz #4
04/11/2025	Guest Speaker – Shotcrete	Frank Townsend, Patriot Shotcrete
04/18/2025	NO CLASS	Good Friday
04/25/2025	Tie Back Walls	Homework #5 Assigned
05/02/2025	Semester Review Final Exam Preparation	Quiz #5
05/16/2025	TBD Final Exam	Date to be confirmed

Handouts: All course content will be made available through Canvas, as appropriate. Students are responsible for all course content regardless of how it is presented. Students must check Canvas frequently to check for new modules and content.

Homework / Homework Format / Late Homework: Students are responsible for submitting all homework assignments (**COMPLETELY** and **LEGIBLY**) before the due date and time shown **in Canvas**. Instructor preference is for students to use engineering computation paper. Late submissions of assignments will not be accepted, unless an absence, and consequently the missed assignment, is substantiated by the Dean of Students Office. Homework can be lengthy, please plan accordingly. Students should consult the professor in advance of the due date if there are any issues or questions regarding the homework, especially since homework content likely appears on a quiz. Students will receive direct feedback on their assignments in Canvas, guiding

the solution; if students do not understand the comments or feedback, they can contact the professor for additional help.

Quizzes and Exams: Students will take all quizzes and exams in-person as scheduled. All quizzes and exams will be available for student review but will be kept / maintained by the professor. Students are permitted to take notes (**not photographs or videos**) when reviewing quizzes in class. There will be NO makeup quizzes or exams unless a result of an absence that is further substantiated and approved by the Dean of Students Office.

Calculation of Course Grade: A weighted average grade will be calculated as follows:

Breakdown		Scale	
Homework	25%	A	100-90
Quizzes	25%	B+	89-85
Midterm	25%	B	84-80
Final	25%	C+	79-75
Total	100%	C	74-70
		D	69-60
		F	Below 60

Professor does take attendance, homework, participation and student's overall commitment to the class when evaluating the final grade.

Instructor Commitment: You can expect the instructor to be courteous, punctual, organized, and prepared for lecture and other class activities; to answer questions clearly; to be available during office hours or to notify you beforehand if office hours are moved; to provide a suitable guest lecturer or pre-recorded lecture when they are traveling or unavailable; and to grade uniformly and consistently.

AI statement: The use of artificial intelligence (AI) is permitted in this course only when explicitly stated in assignments. If students use AI for any course-related work, they must cite it according to the guidelines provided on the **NJIT Library AI Citation page**. If you have any questions about AI use in this course, please contact the course instructor before submitting any assignments. In cases where AI use is not allowed, students are expected to complete work without AI assistance to develop their skills in this subject area.

Students with Documented Disabilities: NJIT is committed to providing students with documented disabilities equal access to programs and activities. If you have, or believe that you may have, a physical, medical, psychological, or learning disability that may require accommodations, please contact the Coordinator of Student Disability Services located in the Center for Counseling and Psychological Services, in Campbell Hall, Room 205, (973) 596-3414. Further information on disability services related to the self-identification, documentation and accommodation processes can be found on the webpage at: (http://www.njit.edu/counseling/services/disabilities.php)

Course Objectives Matrix – CEE 414 – 002

Strategies, Actions and Assignments	ABET Student Outcomes (1-7)	Program Educational Objectives	Assessment Measures
Student Learning Outcome 1: Determine loading on temporary construction structure			
Review loading, live load, dead load, concrete, soil, water	1, 2	1	Homework and exam
Student Learning Outcome 2: Design excavation support			
Determine earth pressure and loading for various soil conditions	1, 2	1	Homework and exam
Design support member sheeting and shoving	1, 2	1	Homework and exam
Student Learning Outcome 3: Discuss and Review construction safety for temporary structure			
Review OSHA 1926	4, 7	1	Class Review and Discussion, Homework, Exam

CEE Mission, Program Educational Objectives and Student Outcomes

The mission of the Department of Civil and Environmental Engineering is:

- to educate a diverse student body to be employed in the engineering profession
- to encourage research and scholarship among our faculty and students
- to promote service to the engineering profession and society

Our program educational objectives are reflected in the achievements of our recent alumni:

1. **Engineering Practice:** Alumni will successfully engage in the ethical practice of civil engineering within industry, government, and private practice, working toward safe, practical, resilient, sustainable solutions in a wide array of technical specialties including construction, environmental, geotechnical, structural, transportation, and water resources.
2. **Professional Growth:** Alumni will advance their skills through professional growth and development activities such as graduate study in engineering, research and development, professional registration and continuing education; some graduates will transition into other professional fields such as business and law through further education.
3. **Service:** Alumni will perform service to society and the engineering profession through membership and participation in professional societies, government, educational institutions, civic organizations, charitable giving and other humanitarian endeavors.

Our **Student Outcomes** are what students are expected to know and be able to do by the time of their graduation:

1. an ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety and welfare, as well as global, cultural, social, environmental and economic factors
3. an ability to communicate effectively with a range of audiences

4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Revised: 1/6/2025