JOHN A. REIF, JR. DEPARTMENT OF
CIVIL AND ENVIRONMENTAL ENGINEERING

NJIT New Jersey Institute of Technology

CE 100 – Introduction to Civil Engineering (CE), Section 003 - Fall 2025

Corequisite: ENGL 101 and MATH 111 or ENGR 101 and MATH 110

OUTLINE OF COURSE

1. COURSE DESCRIPTON

Main Topics: ***"Civil infrastructure – bridges, dams, roads & highways, tunnels, canals, sewer & water systems, and buildings of all types, along with engineering economics***

Introduction to Civil Engineering (CE-100) is a one-credit course that will introduce students to the basics of Civil Engineering construction, design, and inspection. This course will provide an overview of the different disciplines within Civil Engineering, including structures, geotechnical, infrastructure, water resources, engineer economics, computer spreadsheets, environmental, transportation, construction engineering and construction management. CE-100 will facilitate, through class lecture, demonstrations and student participation, a blending of engineering science and technology.

- Guest lecturers may come to class and share their experience working in the field.
- Student organizations and department personnel will be introduced.
- Students will be required to complete a team technical project and make an oral presentation on their project to the class.
- All homework assignments will be due the following week unless otherwise specified by the instructor.

Canvas

Assignments and materials for this course will be posted on Canvas. Students must use their UCID to sign in at **http://www.canvas.njit.edu**

Course Instructors: Frank L. Golon, Ph.D., P.E. Professor

***Office**:* 231 Colton Hall

Office Hours: By appointment

E-mail: **Frank.L.Golon@njit.edu**

2. REQUIRED TEXTS: NONE REQUIRED

One Architectural Scale & One Engineering Scale (bookstore carries)
TI-84 or 89 calculators
Register to the on-line Wall Street Journal (WSJ)
Download Microsoft Excel

3. LECTURE CLASSROOM

Colton Hall 416 Monday: 1:00pm – 3:50pm

4. ATTENDANCE POLICY

Students must sign in for every class. You are required to attend every lecture class. If a class is missed, it is the student's responsibility to submit the homework on the assigned submission date. If you miss more than one (1) class lecture without excuse/prior permission, each subsequent class missed will result in loss of up to 5% of the overall grade. Five (5) or more total missed classes will result in an F grade.

NJIT STUDENT ATTENDANCE POLICY

All students are required to attend every class. Late arrival at class is not permitted. It is the decision of the instructor to admit you to the class late. Approval of late arrival will be considered by the instructor prior to the class. Requests for late arrival must be sent via e-mail to the instructor. Students will not be admitted to class if they overslept or forget they had a class or if they provide some other similar explanation.

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.

5. GRADING POLICY

Homework Assignments (4)	**20%**
Technology Special Topic Site visit Lake Cushetunk Dam Readington Twp., Local Construction Sites	**Extra Credit**
Quizzes and/or Special Project Assignments **1**. Site Civil/Transit 15% 2. Critical Infrastructure 15% 3. Quiz 15%	**45%**
Project Report – Oral Presentation Topic: Civil Engineering *(presentation will be evaluated based on the following traits):* Nonverbal Skills, Verbal Skills and Content	**15%**
Class attendance & Participation Plan to read, scales, code evaluation, etc.	**20%**
Total	**100%**
EXTRA CREDIT: problems to be assigned 10 points **Structural, Eng Eco, geotechnical, site civil,**	

Grading Scale

A	**100-90**
B+	**89-85**
B	**84-80**
C+	**79-75**
C	**74-70**
D	**69-60**
F	**Below 60**

6. WITHDRAWALS AND NJIT HONOR CODE

In order to ensure consistency and fairness in application of the NJIT policy on withdrawals, student requests for withdrawals after the deadline will not be permitted unless extenuating circumstances (e.g., major family emergency or substantial medical difficulty) are documented. The course Professors and the Dean of Students are the principal points of contact for students considering withdrawals.

The NJIT honor code will be upheld, and any violations will be brought to the immediate attention of the Dean of Students. **http://www.njit.edu/academics/pdf/academicintegrity-code.pdf.**

All students are responsible for upholding the integrity of NJIT by reporting any violation of academic integrity to the Office of the Dean of Students. **http://www.njit.edu/doss.** The identity of the student filing the report remains anonymous.

7. CLASS REQUIREMENTS

- Homework must be handed to the instructor in the class. Homework will not be accepted through e-mail or Canvas posting. Homework will not be accepted after the due date. Hand written assignments will not be accepted.

- Each assignment must include the following information on the upper right corner of each page.
    - Your name
    - Date
    - Learning Communities ID (if applicable)
    - Number of pages
    - Assignment Number and/or Assignment Name

- Homework must be stapled if more than two (2) pages. Loose page assignments will not be accepted.

- Cite your references when writing your individual and group reports. Use the format identified in your HUM 101 course.

- Each person will contribute to and be responsible for the team technical report, the presentation slides, and participation in making the presentation.

- At the end of the course, each student will be required to submit an evaluation of the performance of their project team members.

- The schedule is not absolutely fixed. It is prepared only to give students the topics to be covered in the course. Schedule is subject to change as per the availability and convenience of guest lecturers and that of the field visit site personnel.

- Students will be informed of all changes in advance and any changes to the syllabus will be discussed in class.

- Students are encouraged to back up their work on a personal flash drive or compatible media. You are required to save your homework assignments.

- Cell phones/tablets/laptops, etc. must be turned off in class. Electronic devices can be used when it is necessary for the class when directed by the instructor.

- Remove hats, sunglasses, ear buds, but keep on masks.

- Leaving the room for any reason is permissible at any time. Please do so quietly.

8. CEE MISSION, PROGRAM 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 scholarships among our faculty and students
- to promote service to the engineering profession and society

Program Educational Objectives

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 towards safe, practical, resilient and 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 technical and interpersonal 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 academia, 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.

Student Outcomes

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 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 conclusion
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Updated 8/2025

University Catalog 2024 - 2025

CE-100. Fundamentals of Engineering Design. 1 credit, 3 contact hours (2;1;0).
Corequisite: ENG 101 and MATH 111 or ENGR 101 and MATH 110. Teams of students work on open-ended engineering projects. Sections are offered to represent an introduction to real-world engineering design problems in a specific engineering discipline. Topics covered include introduction to basic engineering design elements, processes, measurements, product and project design and development, with hands-on experiments in a specific major area. Students also learn to use engineering tools for computer-aided design and simulation. Technical writing and oral presentation along with project management skills are emphasized. Students are required to take an FED section corresponding to their declared major. Undecided students will be placed in FED sections which best correspond to their interests according to space availability.

Course Objectives

CE 100 – Introduction to Civil Engineering

Strategies and Actions	Student Learning Outcomes	Outcomes (1-11)	Prog. Object.	Assessment Methods/Metrics
Course Objective 1: Enable freshman to work on engineering design problems at the start of their education to stimulate their interest in engineering.				
Students will learn CEE design practices in bridge engineering and construction cost estimating.	Students will be able to perform simple engineering design.	1, 2, 3, 5, 6, 11	1	Class assignments.
Course Objective 2: Enable students to learn the team approach to problem solving.				
Students will work in teams on the assigned design problems.	Students will learn about team dynamics, leadership, scheduling, and cooperation.	3, 4, 6, 7, 10, 11	1, 2	Meetings with instructor. Class assignments.
Course Objective 3: Develop oral and written communication skills.				
Students will be required to make written and oral reports on their class projects.	Students will develop their written and oral presentation skills.	4, 7, 11	1, 2	Class project.

9. LECTURE TOPICS – ENGINEERING AND TECHNOLOGY

Lectures may include, but are not limited, to the following topics.

Introduction to Technology

a. Design/Build/Inspections/Budget/Analyze
b. Drone/Bluetooth Technology
c. Materials Science/Protective Technologies

Civil Engineering – Discipline Specific

a. Structural Engineering
b. Geotechnical Engineering
c. Construction Engineering/Management
d. Engineering Economics
e. Environmental Engineering
f. Contract Law
g. Site Engineering & Surveying

Engineering Topics

a. "The Soft Skills" – Plan reading & scales
b. Engineering cost estimating & scheduling
c. Spreadsheets (EXCEL)
d. PennAve vs. Newark Water Authority–Contract Case Study
e. Basics of Engineering Mechanics
f. Data Presentation-Dr. Hsu testing
g. OSHA & Safety Engineering
h. Life Cycle Assessment

Video Discussion Topics

a. Construction & Inspection Engineering

Project Report (topics suggested by the Professor or other topics as approved by the Professor)

10. COURSE OUTLINE (Subject to updating throughout semester)

Week	Dates	Textbook/Reading	Assignment (*)	Topics
1	8 Sept	To be assigned or hand-outs	Syllabus Review & Intro Arch. Plans	Overview of Civil Engg Industry;
2	15 Sept	Plan reading & scales Building-Arch&Engg	Arch & Engg Plans Student presentation for ASCE & AWWA?	Arch & Engg Plans ASCE & AWWA presentation
3	22 Sept	Plan reading & scales Buildings-Arch & Engg	Concrete Estimate	Arch & Engg Plans Assignment #1
4	29 Sept	Plan reading & scales Site/Infrastructure	Handouts	Lumber Estimates Assignment #2
4a	4 Oct	Field Trip TBD	Plans & shop drawings	Field Trip TBD
5	6 Oct	Hydrology & Hydraulics	Sanitary & Storm design	Rational Method & Manning's Equation
5a	11 Oct	Field Trip TBD-Res	Plans & shop drawings	Field Trip TBD
6	13 Oct	Detention systems & Earth work calcs	Elizabeth & Newark systems	History of Infrastructure Assignment #3
7	20 Oct	Lake Cushetunk Dam Restoration	Original repairs 1994 Inspections Present	Gunite Repairs 2008
8	27 Oct	IAB Engg Economics	IAB Time value Money	IAB Personal Budgets
9	3 Nov	Engg Economics	Time value Money	Personal Budgets Assignment #4
10	10 Nov	Engg Economics Materials	handout, Time value Money	Personal Budgets
10a	15 Nov	Field Trip TBD	Inspection report	Inspection
11	17 Nov	Building design & constr. foundations	Codes deep foundations & bldg. foundation	Local sites
12	24 Nov	Bridge & Truss Analysis	Pasco Bridge	Special Project #2
13	1 Dec	Design requirements Presentations	Wind & Earthquakes	Building and structures
14	8 Dec	Class presentations	Student Presentations	Student Presentations
15	12 Dec	Reading day if Req Presentations	Reading day if Req Student Presentation	Reading day if Req Student Presentation
17	15 Dec	Finals Week	12/15 - 12/19	TBD

Reading day 1 - Dec 12 - Final Exam TBD

OSHA & Ethics will be covered each week specific to the topics
Assignment sheet will be handed out in class and/or found in Canvas with due dates *Actual Assignments may differ from list and can be changed by Instructor during Semester.

Fall 2025 Academic Calendar (refer to NJIT Registrar for specific details)

September 2, 2025:	First Day of Classes
September 8, 2025:	Last Day to Add/Drop Classes & Refund
October 2, 2025:	Wellness Day
November 10, 2025:	Last Day to Withdraw
November 27–30, 2025:	Thanksgiving Recess
December 11, 2025:	Last Day of Classes Mon – Thurs Class
December 12, 2025:	Reading Day
December 14, 2025:	Final Exam Begin
December 20, 2025:	Final Exams End