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

NJIT New Jersey Institute of Technology

CE 332 - 001: STRUCTURAL ANALYSIS **Fall 2025**

Class: **CE 332 - 001**

Location: TIER 111

Time: Lecture: Monday, Wednesday 1:00 PM – 2:20 PM

Instructor: Prof. S. Saigal, Ph.D., P.E.
Email: saigal@njit.edu, 213 Colton Hall, 973-596-5443

Teaching Assistant: TBA

Text: Names: Hibbeler, R. C., author.
Title: Structural analysis/R. C. Hibbeler.
Description: Any edition

Office Hours: Monday 2:30 – 3:30 PM

Prerequisites*: MECH 235 with a grade of C or better. A working knowledge of free body diagrams, equilibrium conditions for force systems and moments subject to concentrated and distributed forces.*

ACADEMIC INTEGRITY

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"

SYLLABUS

WEEK	TOPIC
1	Review of Concepts from Statics and Mechanics of Materials Chapter 3: Review of Analysis of Statically Determinate Trusses
2	Chapter 4: Review of Shear and Moment Diagrams for Statically Determinate Beams
3	Chapter 4: Axial Force, Shear and Moment Diagrams for Statically Determinate Frames
4	Chapter 6: Influence Lines for Statically Determinate Structures
5	EXAM I
5	Chapter 6: Influence Lines for Statically Determinate Structures
6	Computer Analysis of Structures - Introduction to Software RISA 2D
7	Chapter 7: Deflections. The Double Integration Method
8	Chapter 8: Method of Virtual Work: Trusses and Beams
9	EXAM 2
9	Chapter 8: Method of Virtual Work: Continued
10	Chapter 9: Analysis of Statically Indeterminate Structures: Method of Consistent Deformation
11	Chapter 10: Displacement Method of Analysis: Slope Deflection Equations - Beams
12	Chapter 10: Displacement Method of Analysis: Slope Deflection Equations - Beams
13	Problem Solving and EXAM 3
14	REVIEW for Finals

- Students will be informed in advance by the instructor of any modifications or deviation from the syllabus throughout the course of the semester.

SEMESTER WEEKS

WEEK #	DAY	DATE		NOTES
WEEK 1	W	Sept.	3	
WEEK 2	M	Sept.	8	
	W	Sept.	10	
WEEK 3	M	Sept.	15	
	W	Sept.	17	
WEEK 4	M	Sept.	22	
	W	Sept.	24	
WEEK 5	M	Sept.	29	
	W	Oct.	1	
WEEK 6	M	Oct.	6	
	W	Oct.	8	
WEEK 7	M	Oct.	13	
	W	Oct.	15	
WEEK 8	M	Oct.	20	
	W	Oct.	22	
WEEK 9	M	Oct.	27	
	W	Oct.	29	
WEEK 10	M	Nov.	3	
	W	Nov.	5	
WEEK 11	M	Nov.	10	
	W	Nov.	12	
WEEK 12	M	Nov.	17	
	W	Nov.	19	
WEEK 13	M	Nov.	24	
	W	Nov.	26	Friday Classes Meet
WEEK 14	M	Dec.	1	
	W	Dec.	3	
WEEK 15	M	Dec.	8	
	W	Dec.	10	Last Day of Classes

IMPORTANT DATES

Sept	1	Labor Day. University Closed
Sept	2	First Day of Classes
Sept	8	Last Day to Add/Drop a Class
Sept	8	Last Day for 100% Refund, Full or Partial Withdrawal
Sept	9	W Grades Posted for Course Withdrawals
Sept	15	Last Day for 90% Refund, Full or Partial Withdrawal - No Refund for Partial Withdrawal after this date
Sept	29	Last Day for 50% Refund, Full Withdrawal
Oct	2	Wellness Day
Oct	20	Last Day for 25% Refund, Full Withdrawal
Nov	10	Last Day to Withdraw from Classes
Nov	25	Thursday Classes Meet
Nov	26	Friday Classes Meet
Nov	27	Thanksgiving Recess Begins. No Classes
Nov	30	Thanksgiving Recess Ends
Dec	11	Last Day of Classes
Dec	12	Reading Day
Dec	13	Saturday Classes Meet
Dec	14	Final Exams Begin
Dec	20	Final Exams End
Dec	22	Final Grades Due

GRADING SCALE

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

Grading Policy:

ITEM	TIME	GRADE (%)
Homeworks	Weekly	10
Exam 1	Week 5	20
Exam 2	Week 9	20
Exam 3	Week 13	25
Final Exam		25
TOTAL		**100**

- There will be NO make-up quizzes or exams.
- Quizzes and Exams must have Free-Body-Diagrams with Force Vectors shown. ALL work must be shown for full credit.

Homework Policies:

- Follow the syllabus and do the homework problems assigned on CANVAS
- Have your homework ready for each class meeting.
- NO late homework will be accepted.
- All homework MUST include a Free-Body-Diagram to show Force Vectors. All work must be shown for full credit.
- Homework NOT submitted will earn MINUS points deducted from your overall grades.

Helpful Suggestions:

- Take notes and pay attention.
- Ask questions.
- Participate with board work and/or class problem solving.

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.

Outcomes Course Matrix – CE 332 - 101

Strategies, Actions and Assignments	ABET Student Outcomes (1-7)	Program Educational Objectives	Assessment Measures
Student Learning Outcome 1: Identify transition from Physics (science) to Statics (engineering).			
Present engineering approach and problem solving techniques used for vector analysis.	1	1	Homework, exams and success in future courses.
Illustrate applications to practical problems of torque, moments, and couples.	1	1	Homework, bonus problems, and exams.
Student Learning Outcome 2: Analyze and calculate two-dimensional and three-dimensional vectors.			
Illustrate 2D vector components by orientation using trigonometry and proportions.	1	1	Homework and exams.
Use vivid Power Point examples to demonstrate analysis technique for force systems on beams and trusses and frames.	1	1	Homework and exams.
Demonstrate logical approach to spatial vectors by visualization of forces, moments.	1	1	Homework, exams, and bonus challenge problems.
Student Learning Outcome 3: Diagram and employ free body diagrams to formulate and analyze solution of engineering problems.			
Require FBD's, for all problems and emphasize importance of vector directions.	1, 2	1	Homework, bonus challenge problems, and exams.
Illustrate the approach of going from the FBD to the problem solution by formulating the appropriate equation set.	1, 2	1	Homework, bonus challenge problems, and exams.
Provide numerous solved problems available on web. Require numerous homework problems weekly.	1, 2	1	Homework, exams and bonus challenge problems.

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 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