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

NJIT
New Jersey Institute
of Technology

MECH 235-002 and MECH 235-004: Engineering Mechanics: Statics   Spring 2025

Text: ENGINEERING MECHANICS - STATICS
           R.C. Hibbeler, Any Edition

Class: MECH 235-002 and MECH 235-004

Format: Hybrid

Location: WEST LECT 1

Time: MONDAY 10:00 – 11:20 AM (Online)
           WEDNESDAY 10:00 – 11:20 AM (In Class)

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

Teaching   TBA
Assistant:
Office Hours: Wednesday 11:30 AM – 1:00 PM

Zoom Link: TBA

Prerequisites: Phys 111, Math 112. Provides an understanding of equilibrium of particles and rigid bodies subject to concentrated and distributed forces.

<mark>**Students must earn a C or better in this course to register for Strength of Materials, MECH237.**</mark>

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

1	Ch 1: Introduction Ch 2: Statics of Particles, Trig Method (sketch force polygon)
2	Ch 2: Rectangular Components Equilibrium of a Particle
3	Ch 2: Force in Space Forces and Equilibrium in Space
4	Ch 3: Rigid Bodies: Equivalent System of Forces. Scalar (Dot) Products
5	Ch 3: Couples and Force-Couple Systems Equivalent Systems
6	Ch 4: Equilibrium of Rigid Bodies Equilibrium of a 2-Force Body
7	MIDTERM EXAM Ch 5: Centroids and Center of Gravity
8	Ch 5: Distributed Loads
9	Ch 6: Truss Analysis: Method of Joints
10	Ch 6: Truss Analysis: Method of Sections
11	Ch 6: Frame Analysis
12	Ch 9: Moments of Inertia
13	Ch 9: Parallel Axis Theorem
14	Problems and 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	MON.	1/20/2025	MLK, Jr. Day
	WED.	1/22/2025	First Day of MECH 235 Classes

WEEK 2	MON.	1/27/2025	
	WED.	1/29/2025	
WEEK 3	MON.	2/3/2025	
	WED.	2/5/2025	
WEEK 4	MON.	2/10/2025	
	WED.	2/12/2025	
WEEK 5	MON.	2/17/2025	
	WED.	2/19/2025	
WEEK 6	MON.	2/24/2025	
	WED.	2/26/2025	
WEEK 7	MON.	3/3/2025	
	WED.	3/5/2025	
WEEK 8	MON.	3/10/2025	
	WED.	3/12/2025	
NO CLASSES	MON.	3/17/2025	Spring Recess
	WED.	3/19/2025	Spring Recess
WEEK 9	MON.	3/24/2025	
	WED.	3/26/2025	
WEEK 10	MON.	3/31/2025	
	WED.	4/2/2025	
WEEK 11	MON.	4/7/2025	
	WED.	4/9/2025	
WEEK 12	MON.	4/14/2025	
	WED.	4/16/2025	
WEEK 13	MON.	4/21/2025	
	WED.	4/23/2025	
WEEK 14	MON.	4/28/2025	
	WED.	4/30/2025	
FINAL WEEK	MON.	5/5/2025	
	WED.	5/7/2025	Friday Classes Meet

IMPORTANT DATES

DATE		DAY	NOTE
January	27	Monday	Last Day to Add/Drop a Class
January	27	Monday	Last Day for 100% Refund, Full or Partial Withdrawal
January	28	Tuesday	W Grades Posted for Course Withdrawals
February	3	Monday	Last Day for 90% Refund, Full or Partial Withdrawal, No Refund for Partial Withdrawal after this date
February	17	Monday	Last Day for 50% Refund, Full Withdrawal
March	10	Monday	Last Day for 25% Refund, Full Withdrawal
March	16	Sunday	Spring Recess Begins - No Classes Scheduled - University Open
March	22	Saturday	Spring Recess Ends
April	3	Thursday	Wellness Day
April	7	Monday	Last Day to Withdraw
April	18	Friday	Good Friday - No Classes Scheduled - University Closed
April	20	Sunday	Easter Sunday - No Classes Scheduled - University Closed
May	6	Tuesday	Thursday Classes Meet
May	7	Wednesday	Friday Classes Meet
May	7	Wednesday	Last Day of Classes
May	8	Thursday	Reading Day 1
May	9	Friday	Reading Day 2
May	10	Saturday	Final Exams Begin
May	16	Friday	Final Exams End
May	18	Sunday	Final Grades Due

Grading Policy:

ITEM	TIME	GRADE (%)
Homeworks	Weekly	10
Class Quizzes	Each Week	30
Mid-Term Exam	Week 7	30
Final Exam	Week 15	30
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.

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

Homework Policies:
- Follow the syllabus and do the assigned homework problems.
- Have your homework ready 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 quiz grades.

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

Tutoring:
Tutoring facilities will be provided for the class. Additional information concerning tutoring will be provided in the class and posted on CANVAS.

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.

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:

- **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.
- **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.
- **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:

- an ability to identify, formulate and solve complex engineering problems by applying principles of engineering, science and mathematics
- 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
- an ability to communicate effectively with a range of audiences
- 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
- 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
- an ability to develop and conduct appropriate experimentation, analyze and interpret data and use engineering judgment to draw conclusion
- an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Updated 1/6/2025

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 roblems.			
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.