

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



MECH 236-001-003-005-007-HM1 Engineering Mechanics: Dynamics - Fall 2025

- Text:**
1. Hibbeler, R.C., Engineering Mechanics-Dynamics, 13th Edition, Prentice Hall, 2010, ISBN 978-0-13-291127-6 or 0-13-291127-2
 2. NCEES, Fundamentals of Engineering Supplied-Reference Handbook, 8th Edition, (optional, free from: <https://ncees.org/engineering/fe/>)

Instructor: **Yung Ding**, 264 Colton Hall, 973-642-7046, ding@njit.edu

Prerequisite: Mech 235 (or Mech 234 for EE, CoE, IE, ME majors). Provides an understanding of the mathematics of the motion of particles and rigid bodies, and of the relation of forces and motion of particles.

Week	Topic	Section	Format	Week of
1	Kinematics of Particles,	12-1,2,4,5,6	In person	9/2/2025
2	Kinematics of Particles	12-7,9,10	Zoom	
3	Force & Acceleration	13.1 - 13.3	In person	9/16
4	Force & Acceleration	13.4 - 13.5	zoom	
5	Exam-1, in person only Cover ch12 only	Details on canvas	In person	9/30 & 10/2
6	Energy & Work	14.1 - 14.6	zoom	
7	Momentum	15.1 - 15.3	In person	10/14
8	Impact, Kinematics of Rigid Bodies	15.4, 16.1 - 16.4	zoom	
9	Exam-2, in person only	Details on canvas	In person	10/28 & 10/30
10	Rigid body: Relative Velocity	16.5	zoom	
11	Rigid body: Instant Center	16.6	zoom	
12	Exam-3, in person only	Details on canvas	In person	11/18
13	Rigid Bodies Acceleration Kinetics of a Rigid Body	16.7, 17.1 – 17.3	zoom	11/25 Tue is Thursday class
14	Kinetics of a Rigid Body	17.4	In person	12/2
15	Final Exam, in person only	Details on canvas	In person	njit.edu

Note: withdraw deadline: 11/10/2025

CLASS SCHEDULE:

Odd weeks are in person class. Even weeks are zoom class. But this pattern changed from week 11 due to Thanksgiving.

TUTORIAL HELP:

Tutorial schedule (in person and zoom link) is on canvas under "pages".

EXAMs:

Scientific calculator is needed for all exams. Other electronic devices, storage media, or accessories of any kind, are **NOT** allowed during any exam. All exams are in person. Students should not leave the classroom before submit the exam.

GRADING:		The grade schedule:	
Homework	16 %	A = 90+	C = 70+
Exam-1	21 %	B+ = 85	D = 60+
Exam-2	21%	B = 80+	F = 59 or less
Exam-3	21%	C+ = 75+	W
Final Exam	21%		
Total	100%		

Incomplete is given in rare instances where the student is unable to attend or otherwise do the work of the course due to illness, etc. The grade must be made up in the next semester by completing all of the missed work.

HOMEWORK:

To obtain full credit, you must submit the work on time and in the proper form. A minimum of 70% of the homework must be submitted to receive a passing grade in the course. Late homework will get reduced points (5% off for each day). The followings are required for homework:

1. On the top of the first page, PRINT your name, class day and time (e.g. Tuesday 2pm), date.
2. The problems must be presented in numerical order as assigned. If more than one problem on the same page, [a clear dividing line is required between problems](#). Writings are to be neat, clear and legible.
3. Draw neat, clear free body diagrams if force/moment in the problem. Use a straight edge if needed.
4. Box the final answer(s) with unit(s) (and direction if needed).
5. [All HW submission will be on canvas. Do not email HW.](#)

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

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 – MECH 236 – 001-003-005

Strategies, Actions and Assignments	ABET Student Outcomes (1-7)	Program Educational Objectives	Assessment Measures
Student Learning Outcome 1: Understand the theoretical relationship among velocity, acceleration, force, energy and momentum for particle. Apply the theory to engineering problems			
Learn equations and apply them to solve engineering problems for kinematics only situation	1,2	1	Weekly homework, quizzes.
Learn equations and apply them to solve engineering problems for motion and force.	1,2	1	Weekly homework, quizzes.
Student Learning Outcome 2: Understand the theoretical relationship among velocity, acceleration, force and moment for rigid body. Apply the theory to engineering problems			
Learn equations and apply them to solve engineering problems for kinematics only situation	1,2	1	Weekly homework, quizzes
Learn equations and apply them to solve engineering problems for motion and force.	1,2	1	Weekly homework, quizzes
Student Learning Outcome 3: Learn to solve combined particle and rigid body problems.			
Apply particle and rigid body equations to combined engineering problems	1, 2	1	Weekly homework, quizzes

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