

MECH 236 - 002-004-006-008-HM2 Engineering

Spring 2025

Mechanics: Dynamics

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: Prof. Y. 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	1/19/2025
2	Kinematics of Particles	12-7,9,10		
3	Force & Acceleration	13.1 - 13.3	In person	2/2
4	Force & Acceleration	13.4 - 13.5		
5	Exam-1, in person only	Details on canvas	In person	2/16
6	Energy & Work	14.1 - 14.6		
7	Momentum	15.1 - 15.3	In person	3/2
8	Impact, Kinematics of Rigid Bodies	15.4, 16.1 - 16.4		
	Spring break			
9	Exam-2, in person only	Details on canvas	In person	3/23
10	Rigid body: Relative Velocity	16.5		
11	Rigid body: Instant Center	16.6	In person	4/6
12	Rigid Bodies Acceleration Kinetics of a Rigid Body	16.7, 17.1 – 17.3		
13	Exam-3, in person only	Details on canvas	In person	4/20
14	Kinetics of a Rigid Body	17.4		
15	Final Exam, in person only	Details on canvas	In person	njit.edu

Note: withdraw deadline: 4/7/2025

CLASS SCHEDULE:

Odd weeks are in person class. Even weeks are zoom class. Zoom link on Canvas.

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 during exam.

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

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

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.

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