Course syllabus

ME 225-A Dynamics
Spring 2025

LECTURES:
Time: Tuesdays & Thursdays 2:00pm-3:15pm
Location: Gateway South 216

INSTRUCTOR: Professor Christophe Pierre

- Office: EAS 404
- Email: cpierre@stevens.edu
- Office hours: Tuesday 12:30-1:30pm and Thursday 3:30-4:30pm

TEACHING ASSISTANT: Mr. Arash Hashemi

- Office: Carnegie Laboratory, next to Office 210
- Email: ahashemi1@stevens.edu
- Office hours: Tuesday 11:30am-12:30pm, Wednesday 3:00-5:00pm, and Thursday 11:30am-1:30pm

- *Office hours are free tutoring! Make sure to take advantage of them!*
- Feel free to email the TA or the Instructor to arrange for an in-person or Zoom meeting outside of regular office hours.

ATTENDANCE AND PARTICIPATION:

- Class attendance is required.
- Lectures will not be recorded.
- A significant part of class time will be dedicated to solving practice problems. Students are expected to participate in class activities and ask/answer questions.
- *5% of course grade is assigned to Attendance and Participation.*

TEXTBOOK AND LECTURE NOTES:

- Textbook: Hibbeler, R. C. (2022), *Engineering Mechanics: Dynamics* (15th ed.), Pearson (ISBN-13: 978-0134814988).
- Printed book and e-book are available, including Pearson+ cost-saving option.
- The textbook will be used for most of the lecture materials and example problems.
- Lecture notes will be available on Canvas.

HOMEWORK:

- There will be 10 homework assignments. **Due dates are listed in the Course Schedule on Canvas.**
- Homework must be uploaded to Canvas **no later than 11:59pm** on the due date. Late homework will **not** be accepted.

- Homework solutions will be posted shortly after the deadline.
- Student collaboration on homework is encouraged, but duplication is **not** permitted.
- Some homework will require the use of MATLAB or Excel.

EXAMINATIONS:
There will be *three quizzes* and *one final exam*. All examinations are closed textbook and closed notes. You are allowed 2 pages (*i.e.*, 1 sheet front and back) of formulas for the quizzes, and 4 pages (*i.e.*, 2 sheets front and back) for the final exam. *No solved problems* are allowed on the formula sheets. You must write your name on formula sheets and submit them with your exam.

Course topics for each examination are:
- Quiz 1: Chapter 12
- Quiz 2: Chapters 13 & 14
- Quiz 3: Chapter 15 & 16
- Final Exam: Chapters 17, 18 & 19

All examinations will be approximately 75 minutes in duration and held during the regular class time, according to the following schedule:

Quiz 1:	Tuesday, February 25, 2025
Quiz 2:	Thursday, March 27, 2025
Quiz 3:	Thursday, April 17, 2025
Final exam:	Tuesday, May 6, 2025

Make-up exams will **not** be provided except for documented emergencies. If an emergency unexpectedly prevents you from attending an exam, *you must notify the TA or Instructor **prior to the exam time**; a no-show will result in the **grade of zero (0)** for the exam*.

PROJECT:
Teams of approximately four students will be formed to develop a collaborative project. The project will deal with the design and analysis of a real-life application that involves dynamics. The project will be assigned in early March. A preliminary report will be due April 8, and a final report will be due April 24. A group presentation will also be required, which will take place during class the week of April 29.

GRADE SCHEME:
- Attendance and participation 5%
- Homework 20%
- Project 15%
- Quizzes and final exam. ..... 60% — @ 15% each

Note: The lowest homework grade will be dropped.

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ACADEMIC CATALOG DESCRIPTION:
Particle kinematics and kinetics, systems of particles, work-energy, impulse and momentum, rigid-body kinematics, relative motion, Coriolis acceleration, rigid-body kinetics, direct and oblique impact, eccentric impact.

TOPICS COVERED:
Chapter 12: Introduction to dynamics, kinematics of particles, curvilinear motion
Chapter 13: Kinetics of particles, Newton's laws, free body diagrams
Chapter 14: Work-Energy principle and conservation of energy for particles
Chapter 15: Linear/angular impulse-momentum for particles,
conservation of linear/angular momentum, impact
Chapter 16: Planar kinematics of rigid bodies
Chapter 17: Planar kinetics of rigid bodies
Chapter 18: Work-energy methods for rigid bodies
Chapter 19: Impulse-momentum methods for rigid bodies

LEARNING OUTCOMES:
1. You are able to perform a kinematic analysis of a particle in rectilinear and curvilinear motion.
2. You are able to apply the equations of motion to solve kinetic problems involving a particle or system of particles.
3. You are able to apply the principle of work and energy to solve kinetic problems involving a particle or system of particles.
4. You are able to apply the principle of impulse and momentum to solve kinetic problems involving a particle or system of particles.
5. You are able to perform a kinematic analysis of a rigid body or a system of rigid bodies (e.g. linkage).
6. You are able to apply the equations of motion to solve kinetic problems involving rigid bodies.
7. You are able to apply the principle of work and energy to solve kinetic problems involving rigid bodies.
8. You are able to apply the principle of impulse and momentum to solve kinetic problems involving rigid bodies.

ACADEMIC INTEGRITY:
- Students must abide by the provisions of the Stevens Honor System. Any violation will be forwarded to the Honor Board.
- The following pledge shall be written in full and signed by every student on homework, quizzes and exams assigned by the course instructor. No work shall be graded unless the pledge is written in full and signed.

  "I pledge my honor that I have abided by the Stevens Honor System."

LEARNING ACCOMMODATIONS:
Stevens Institute of Technology is dedicated to providing appropriate accommodations to students with documented disabilities. The Office of Disability Services (ODS) works with undergraduate and graduate students with learning disabilities, attention deficit-hyperactivity disorders, physical disabilities, sensory impairments, psychiatric disorders, and other disabilities to help students achieve their academic and personal potential. They facilitate equitable access to the educational programs and opportunities offered at Stevens and coordinate reasonable accommodations for eligible students. These services are designed to encourage independence and self-advocacy with support from the ODS staff. The ODS staff will facilitate the provision of accommodations on a case-by-case basis.

For more information about Disability Services and the process to receive accommodations, visit https://www.stevens.edu/student-diversity-and-inclusion/disability-services. If you have any questions, please contact the Office of Disability Services at disabilityservices@stevens.edu or by phone: 201.216.3748.

Disability Services Confidentiality Policy
Student Disability Files are kept separate from academic files and are stored in a secure location within the Office of Disability Services. The Family Educational Rights Privacy Act (FERPA, 20 U.S.C. 1232g; 34CFR, Part 99) regulates disclosure of disability documentation and records maintained by Stevens Disability Services. According to this act, prior written consent by the student is required before our Disability Services office may release disability documentation or records to anyone. An exception is made in unusual circumstances, such as the case of health and safety emergencies.

INCLUSIVITY:
Stevens Institute of Technology believes that diversity and inclusiveness are essential to excellence in academic discourse and innovation. In this class, the perspective of people of all races, ethnicities, gender expressions and gender identities, religions, sexual orientations, disabilities, socioeconomic backgrounds, and nationalities will be respected and viewed as a resource and benefit throughout the semester. Suggestions to further diversify class materials and assignments are encouraged. If any course meetings conflict with your religious events, please do not hesitate to reach out to your instructor to make alternative arrangements.

You are expected to treat your instructor and all other participants in the course with courtesy and respect. Disrespectful conduct and harassing statements will not be tolerated and may result in disciplinary actions.

Name and Pronoun Usage
As this course includes group work and class discussion, it is vitally important for us to create an educational environment of inclusion and mutual respect. This includes the ability for all students to have their chosen gender pronoun(s) and chosen name affirmed.

If the class roster does not align with your pronouns and/or name, please inform the instructor of the necessary changes.

Religious Holidays
Stevens is a diverse community that is committed to providing equitable educational opportunities and supporting students of all ethnicities and belief systems. Religious observance is an essential reflection of that rich diversity. Students will not be subject to any grade penalties for missing a class, examination, or any other course requirement due to religious observance. In addition, students will not be asked to choose between religious observance and academic work. Therefore, students should inform the instructor at the beginning of the semester if a requirement for this course conflicts with religious observance so that accommodations can be made for students to observe religious practices and complete the requirements for the course.

MENTAL HEALTH RESOURCES:
Part of being successful in the classroom involves a focus on your whole self, including your mental health. While you are at Stevens, there are many resources to promote and support mental health. The Office of Counseling and Psychological Services (CAPS) offers free and confidential services to all enrolled students who are struggling to cope with personal issues (e.g., difficulty adjusting to college or trouble managing stress) or psychological difficulties (e.g., anxiety and depression). Appointments can be made by phone (201-216-5177), online at https://stevensportal.pointnclick.com/confirm.aspx, or in person on the 2nd Floor of the Student Wellness Center.

EMERGENCY INFORMATION:
In the event of an urgent or emergent concern about your own safety or the safety of someone else in the Stevens community, please immediately call the Stevens Campus Police at 201-216-5105 or on their emergency line at 201-216-3911. These phone lines are staffed 24/7, year-round. For students who do not reside near the campus and require emergency support, please contact your local emergency response providers at 911 or via your local police precinct. Other 24/7 national resources for students dealing with mental health crises include the National Suicide Prevention Lifeline (1-800-273-8255) and the Crisis Text Line (text "Home" to 741-741). If you are concerned about the wellbeing of another Stevens student, and the matter is *not* urgent or time sensitive, please email the CARE Team at care@stevens.edu. A member of the CARE Team will respond to your concern as soon as possible.