Worcester Polytechnic Institute

PH1110: General Physics – Mechanics
Physics Department
E2 Term 2026

Instructor:

Name: Prof. Thomas (TJ) Noviello
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Textbook and Required Materials:

Textbook: OpenStax University Physics Volume 1 (free online) … download here
Canvas: Be sure that you are on the Canvas site and actively engaged with any posted materials. Important announcements and assessment materials will be accessed on Canvas as well.
Zoom App: You will need Zoom installed on your electronic device to access office hours for this term. Additionally, some classes may be conducted on Zoom.

Course Meetings

All classes will meet online via Zoom (Link)
Monday & Wednesday, 9 – 11:30am
Friday, 9 – 10:50am

Please note that Workday labels sections as "Lecture" & "Discussion" – there is no difference between these sections, so be sure to attend/watch all portions of the course.

Catalog Description:

Introductory course in Newtonian mechanics, which includes: kinematics of motion, vectors, Newton's Laws, circular motion and gravitation, work/energy, impulse/momentum, and rotational motion. A simple definition that I always provide for physics is *systematic wonder*. Students may not receive credit for both PH 1110 and PH 1111.

Recommended Background:

Concurrent study of MA 1021 (Calculus I).

Overall Learning Outcomes:

- Apply concepts, principles, and fundamental laws in physics to model physical systems to solve problems and perform experiments and identify their relevance to everyday circumstances in a broad interdisciplinary context.
- Solve problems individually and as a team and demonstrate qualitative reasoning to analyze the solutions to a problem or experiment and identify the assumptions and limitations.
- Demonstrate critical thinking, analytical and quantitative reasoning by using algebra, trigonometry, and calculus to set up and solve mathematical descriptions of physical systems and to calculate measurable quantities.
- Represent and communicate physical situations in multiple representations that include diagrams, figures, written text, graphs, tables, equations, verbally, with experimental data, and other forms.

- Reduce ill-defined and complex problems and experiments to be able to obtain reasonable solutions and recognize that science, engineering, and physics is a process.
- Gain an appreciation for how physics applies to all fields of study.

Course Inclusivity

Please join me in striving to support an environment that creates a sense of community, safety, trust, authentic engagement, where we respect each other and our diverse backgrounds and identities we bring to the classroom, WPI, and the world. Participate in discussions but recognize that listening and reflecting is a powerful skill to understand different perspectives. Value the input from others and be aware of the assumptions you are making in any situation. Help me and each other to be better human beings.

Class Environment

Education research has shown that:

- The most learning occurs in an environment characterized by high expectations and respect and care for individual students, and where the value of collaboration is stressed over competition.
- The most learning occurs in an active classroom environment where students take responsibility for learning rather than being passive receptors of the professor's knowledge.
- Students can learn as effectively or more effectively from peers than from a professor.
- Facilitating development of students' communication, teamwork, and interpersonal skills is as important as helping them learn physics, science, and engineering.
- Professors and students are equals in the learning process. I have as much to learn about teaching and people as they have to learn about physics.

In-person Class Expectations

This course will be offered via Zoom with a synchronous option. It is *not* mandatory to attend the synchronous/live version as I understand that some of you may have internships or job duties. However, I encourage everyone to attend the live portions so we can get to know one another better, to ask questions, and to make a more active experience.

Laboratory

There are several purposes to the laboratory. First, it balances *theory with practice* as we get a chance to see in detail the descriptive and predictive power of physical laws. Secondly, we also discover that much of what we first present in class is *ideal* and *reality* is always more complicated, subtle, and messy. Recognizing why something does not quite work out and figuring out why is very powerful in learning and modeling systems. Finally, and *most importantly*, there is a focus are on skill development such as experimental design, data analysis, communication, evidence-based reasoning, and decision-making. Prof. Veneta Tountcheva is our Lab Manager (vtountcheva@wpi.edu). Please direct lab questions to your lab instructor(s) and/or our Lab Manager.

Communication:

Office hours: We will negotiate office hours together on the first day of class.

Email: The best way to contact me is via email. Please use "PH1110" in the subject line, and I will typically respond within 24 hours.

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Course Approach:

Week	Date Range	Topics and Assignments
1	7/6 – 7/10	**Topics:** Measurement, unit analysis, the basics of motion, and kinematics in one- and two-dimensions **Readings:** Chapters 1-4 **Homework:** Readings, classwork problems, SMART goals, and Problem Set #1 due 7/11
2	7/13 – 7/17	**Topics:** Newton's Laws and Applications of Newton's Laws (including Circular Motion and Newton's Law of Gravity) **Readings:** Chapters 5, 6, and 13 **Homework:** Readings, classwork problems, weekly reflection, and Problem Set #2 due 7/18
3	7/20 – 7/24	**Topics:** Rotational Statics and Dynamics **Readings:** Chapters 10, 11, and 12 (only 12.1 and 12.2) **Homework:** Readings, classwork problems, weekly reflection, and Problem Set #2 due 7/25 **Assessment:** Exam #1 (7/23)
4	7/27 – 7/31	**Topics:** Work, Energy, & Energy Conservation **Readings:** Chapters 7 and 8 **Homework:** Readings, classwork problems, weekly reflection, and Problem Set #4 due 8/1
5	8/3 – 8/7	**Topics:** Momentum, Collisions, & Momentum Conservation

		Readings: Chapter 9 **Homework:** Readings, classwork problems, final reflection, and Problem Set #5 due 8/8 **Assessment:** Exam #2 (8/8)

Course Requirements:

1. **Grade Determination Breakdown:**

a. Exams (200 points). There will be a total of two exams, where each exam will be worth 100 points. In general, you can expect all exams to consist *only* open response questions with multiple parts. Exams will be done on Canvas outside of class time. Although exams will be timed, you are welcome to request extended time.

b. Lab (200 points). There is lab component integrated with the class. *You are required to complete all labs and submit a lab report for each of them*. The lab grade will be the average of the scores over all the lab reports.

c. Homework assignments (300 points). Each week will consist of a formal problem set due at the conclusion of the week. There will also five problem sets throughout the term, each worth 60 points. Solutions to the problem set will be posted at least one day prior to the due date. You are expected to turn in your original solutions, corrections to your original solutions, and a short reflection piece. *All corrections and reflections must be clearly shown*, *and if corrections are not present no points will be awarded on the assignment*. Your short reflection will document what skills you have mastered, where you need improvement, and an action plan/goal setting.

d. In-class assignments (200 points). All classes will consist of exercise sets that will be graded based upon your effort and diligence towards understanding the presented material. Exercise sets may be simply practicing the methods learned in class, simulations, or short activities. Specific exercises will be due by the end of the week. Exercises left unsolved can be treated as practice problems for your own benefit.

e. Goal settings, reflections, and inquiry (100 points). An important element of success in any workplace is the writing of *SMART goals* (Specific, Measurable, Achievable, Relevant, and Timely). Setting goals helps to maintain focus and serve as a reminder of why we are learning. Your goals will serve as a guide to ensure you are focused on learning the content along with connecting the content to your own studies and interests. *Reflections* are an opportunity to consider progress towards meeting goals and to determine what needs to be done to bring them into realization. This is an opportunity to keep yourself honest and monitor your learning of content. *Asking questions* is vital to understanding material – it is expected to join office hours or ask questions whenever needed. If you are unsure of how to carry out any of these processes, be sure to ask me for assistance as soon as possible.

Your course grade will be a percentage of the total amount of points earned divided by the total possible points (1000 points). Please make every effort to keep track of your grade throughout the term to monitor your progress.

2. **Late Work**

   Late work is not encouraged in this course. However, if a difficult situation arises that will result in an assignment being turned in after its due date, please communicate this with me so that I am aware.

3. **Class Participation Expectations and Criteria**

   You are required to watch each class and participate in the provided in-class problem sets and explorations. Classwork assignments are expected to be completed within the allotted time.

Academic Integrity:

You are expected to be familiar with the policies surrounding academic integrity, which can be found here. Consequences for violating the Academic Honesty Policy range from earning a zero on the assignment, failing the course, or being suspended or expelled from WPI.

Common examples of violations include:

- Copying and pasting text directly from a source without providing appropriately cited credit.
- Paraphrasing, summarizing, or rephrasing from a source without providing appropriate citations.
- While working in groups for the labs and solving the homework problems is strongly encouraged in this class, collaborating on exams is considered cheating.
- Turning in work where a good portion of the work is someone else's, even if properly cited.

Academic Accommodations:

Students with approved academic accommodations should plan to submit their accommodation letters through the Office of Accessibility Services Student Portal. Should you have any questions about how accommodations can be implemented in this particular course, please contact me as soon as possible. Students who are not currently registered with the Office of Accessibility Services (OAS) but who would like to find out more information about requesting accommodations, documentation guidelines, and what the accommodated interactive process entails should plan to contact OAS either by email (AccessibilityServices@wpi.edu), by phone (508) 831-4908, or by stopping by the office on the 5th floor of Unity Hall.

Support Information:

Support is always available to students in this course. Along with office hours provided by the instructor and negotiated by the students, Peer Learning Assistants and/or Teaching Assistants will also offer office hours at locations specified on our Canvas landing page. In your endeavors to master course content, it is also highly suggested to do the following:

- Properly utilize the textbooks. This means *not* reading the textbook like a novel, but using it as a reference guide to support any misunderstandings or difficulties you are having. For example, skip to a particular section, try the text's practice problem(s), and then go to the end of the chapter to try to solve end of chapter problems.
- Form study groups. Research has shown the benefits of working in groups and collaboration, especially when all members of a group work towards avoiding distractions. It is recommended that you find individuals that you work well with and sit with them in class and continue working together outside of class. Negotiate a regular space and meeting time ahead of time to avoid potential conflicts.
- Use study patterns shown to provide the best results. Start assignments ahead of time and do not cram for exams. Study and work in reasonable time intervals, and provide room for breaks.

Gordon Library:
Gordon Library offers research support to all WPI students, at any stage of your academic career. For any research-related questions, general or specific, please feel free to contact the Library. Research librarians provide individual and group research consultations, and are happy to work with students in-person or online. Reach out to Gordon Library research librarians by doing one of the following:

- Make an appointment to set up a meeting with a librarian for research help one-on-one or in a small group.
- Email research librarians at reslib@wpi.edu and a librarian will get back to you within one business day.
- Use our chat service to get a quick response from someone who can help you or refer you to the right person.

Grading Policy:
Final course grades are based on a student's performance as follows:

Letter Grade	Percentage
A	90 - 100
B	80 - 89
C	70 - 79
NR	< 70

A course incomplete may be granted if the student demonstrates progress towards content mastery and maintains communication with me. The conversation around being granted an incomplete should begin one week prior to the end of the term. If an incomplete is granted, a timeline to submit assignments will be built and agreed upon by the student and myself.

Changes to the Syllabus:
This syllabus is a guide, and every attempt is made to provide an accurate overview of the course. However, circumstances and events may make it necessary for the instructor to modify the syllabus during the term and may depend, in part, on the progress, needs, and experiences of the students. Changes to the syllabus will be made in writing and in advance.