SYLLABUS – Please read carefully!

SPRING Semester 2026

PHY 095

Discovery: Physics through History and the Modern Age

3 credits

As a fundamental science, physics lies at the heart of modern science and technology. Understanding basic physical principles is a first step toward meaningfully engaging with contemporary scientific topics and their broader implications.

This course is not a history of science class, but a non-standard way of learning physics by following the arrow of time from the historical roots of science and physics to modern developments. Along this path, we will explore how key concepts – such as motion, energy, light, matter, space, time, and quanta – emerged and evolved, and how they connect to modern science and technology. The course is accessible with basic mathematics and relies only on elementary algebra; no calculus or advanced mathematical background is required. Just as one does not need to be a medical doctor to engage with contemporary medical topics, one does not need to be a high-energy physicist to read about the fundamental particles of the universe.

My hope is that, whatever your future profession, if someone asks you in a few years why objects fall to the ground, you will feel comfortable talking about gravity – and perhaps even mentioning gravitons or quantum field theory. There is something deeply fascinating about being aware of the scope of human knowledge, even in an approximate way. We already do this in many areas of life; this course invites you to do it with physics as well.

Instructor

Prof. Paola M. Cereghetti
pmc5@lehigh.edu
Office: LL 410
Office hours: I will be available after each class, please e-mail me if you need to meet one on one. Thank you!

Class Meetings

Monday and Wednesday: From 12:10pm to 1:25pm in room LL 511.

Textbook and Class Notes

There is not a mandatory textbook for this course, I'll be drawing from a diverse range of sources and I will provide you with the necessary materials.

Attendance

Attendance is important in this course and will count toward your grade. If you need to miss a class for a valid reason or because of extenuating circumstances, please let me know – ideally in advance, though an email right afterward is also fine. You may miss up to two class meetings without penalty, *whether or not you have an official excuse*. If you miss more than two classes, 0.5 points (out of 10) will be deducted from your attendance grade for each additional absence. My priority is to support your learning, so as long as we keep an open line of communication and I understand what is going on, *extenuating circumstances will be taken into consideration.* Please note that frequent absences may make it harder to fully participate in class and can therefore affect your participation or *icebreaker* (see below) grade.

Homework

Homework will be assigned about twice per week to prepare you for in-class *icebreakers* (see below) and discussions, with Monday assignments due on Wednesday typically being shorter. You may use AI to help understand the readings, but written responses should be your own, and you should be able to explain what you submit. Homework must be handwritten on the paper provided in class. Missed assignments result in a one-point deduction (out of 10), but please reach out in advance if extenuating circumstances arise.

Class Participation

We will have regular in-class activities and discussions. To support focus and meaningful engagement, phones and laptops are not permitted during class unless explicitly stated otherwise. As long as you stay engaged and make a genuine effort to participate, you will be fine. Participation does not mean impressing others with polished comments; showing interest, contributing during class activities, and asking clarification questions are all valuable forms of participation.

Icebreakers

We will usually begin class with a short icebreaker activity that asks you to apply ideas from the readings, homework, or recent class discussions. If you completed the homework yourself (without AI, unless it was part of the assignment), you should have no trouble completing your icebreaker. These icebreakers are meant to help you build a strong foundation for understanding new topics, and at times they may challenge or puzzle you.

Quizzes

There will be 4, 30 minutes in class quizzes (a hybrid of a quiz and a hour exam). They will be on the following dates: Wednesday, February 11, 2026; Wednesday, March 4, 2026; Wednesday, April 1, 2026; and Wednesday, April 22, 2026.

Final Exam

We will decide the nature of the final exam together.

Use of Generative AI

For this course, there is no formal policy restricting the use of AI, as enforcing such rules is not realistic. My personal guideline is that over-reliance on any single tool is rarely a good idea, so I encourage you to use your own judgment. My goal is to design activities that are meaningful and engaging regardless of AI use. If you have suggestions for activities you find particularly effective or "AI-resistant," I would be very glad to hear them and consider incorporating them into the course.

Grading

Your course grade will be based on attendance, homework and class participation, the quality of your icebreaker, as well as quizzes and the final exam, as outlined below:

20%	Attendance
30%	Homework & Class participation
10%	Icebreakers
20%	Quizzes
20%	Final exam

Accommodations for Students with Disabilities

Lehigh University is committed to maintaining an equitable and inclusive community and welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact Disability Support Services (DSS), provide documentation, and participate in an interactive review process. If the documentation supports a request for reasonable accommodations, DSS will provide students with a Letter of Accommodations. Students who are approved for accommodations at Lehigh should share this letter and discuss their accommodations and learning needs with instructors as early in the semester as possible. For more information or to request services, please contact Disability Support Services in person in Williams Hall, Suite 301, via phone at 610-758-4152, via email at indss@lehigh.edu, or online.

Accommodations for your Instructor

Your professor has an auditory processing issue (CAPD). To facilitate better understanding, it's advised to minimize acoustic distractions. *You can research CAPD online to gain insight into its potential impact on concentration, listening, and communication. Symptoms can vary in both range and intensity from person to person.*

- Please refrain from chatting or making unnecessary noises during class. Please keep in mind that individuals with CAPD may perceive sounds as distracting even at very low thresholds.
- Students are expected to arrive on time for class. If you do happen to arrive late, please choose a seat near the door and ensure that the door closes quietly. Do not make a habit to be late.
- If you need to leave class early, please let your instructor know in advance.
- Unless there is an emergency, students are kindly asked to avoid entering or exiting the classroom during class time. Given that our class runs for 1 hour and 15 minutes, I will always include a brief break.
- In general, processing student questions while simultaneously reading their work and formulating answers can be problematic. This is particularly true for questions asked at the beginning or end of class in the noisy environment when students are entering or leaving the classroom. There might be instances when your professor will request you to email your question, and she will reply at a later time.

Thank you for your understanding!

The Principles of Our Equitable Community

Lehigh University endorses The Principles of Our Equitable Community. We expect each member of this class to acknowledge and practice these Principles. Respect for each other and for differing viewpoints is a vital component of the learning environment inside and outside the classroom.

Academic Integrity

All members of the Lehigh community have a responsibility to maintain academic integrity. Resources and details of expectations at Lehigh are available on the Provost's website. It is expected that all students will abide by these standards throughout the course (e.g., homework, quizzes, papers, exams, projects, etc.). Academic integrity case studies will be discussed on the first day of class, and students are encouraged to ask questions for further clarity throughout the semester. Violations of academic integrity standards will not be tolerated and will be handled according to the guidelines in the University's Student Conduct System.

Harassment and Non-Discrimination

Lehigh University upholds the Principles of Our Equitable Community and is committed to an educational, working, co-curricular, social, and living environment for faculty, staff, and students. The University does not discriminate in its admissions practices, employment practices, or educational programs or activities on the basis of age, color, disability, ethnicity, familial status, gender expression, gender identity, genetic information, marital status, national origin (including shared ancestry), pregnancy or related conditions, race, religion, sex, sexual orientation, and veteran or military status. Harassment or discrimination is unacceptable behavior and will not be tolerated. The University strongly encourages (and, depending upon the circumstances, may require) students, faculty, or staff who experience or witness harassment or discrimination, or have information about harassment or discrimination in University programs or activities, to immediately report such conduct.

If you have questions about Lehigh's Policy on Harassment and Non-Discrimination or need to report harassment or discrimination, contact the Equal Opportunity Compliance Coordinator (Alumni Memorial Building / 610 758 3535 / eocc@lehigh.edu).

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