



PHYS 101

20th Century Physics

Credit Hours: 3.00

Spring 2025

COURSE SPECIFICS

COURSE DESCRIPTION

A presentation of basic physics as understood at the beginning of the 20th Century. Major advances in physical thought since 1900 are emphasized. Intended for non-concentrators.

INSTRUCTOR INFORMATION

- Prof. Carlos Yero
- **Email:** yero@cua.edu
- **Office Number:** Hannan 210
- **Office Phone:** (202) 319-6617
- **Office Hours:** any time, otherwise, by appointment (via email), as needed.

CLASS MEETINGS/WEBPAGE

- Tuesdays, Thursdays
- 11:10 am - 12:25 pm
- Hannan Hall, Room 106
- Class Webpage: <https://yero1990.github.io/cuaPHY101.github.io/>

A personal note from the instructor for succeeding in this course: The lectures and physics demonstrations will only be the “*tip of the iceberg*” in your learning process. The real learning will take place by reading the textbook material and doing the assigned homework. Watching someone play piano is **NOT** the same as trying to play yourself. Similarly, in physics and any other course, watching the instructor solve example problems and do demonstrations is not sufficient for success. You might get a false sense of knowing how to solve a problem by watching someone else solve it, however, it is not until you try to solve the problem yourself that you might discover potential conceptual pitfalls. Please don’t hesitate to ask questions or seek help from the moment the material becomes unclear to you. There are **NO** such things as “*dumb questions*” in physics. Both the Teaching Assistant (TA) and I will be available for providing help with the homework / problem-solving tips as well as any other aspect of conceptual physics you may want to discuss/clarify.

TEACHING ASSISTANT (TA)

- **Teaching Assistant:** Tri Phan (phantri@cua.edu)
- **Office Number:** Hannan 131
- **Phone/Text:** 206-295-5167
- **Office Hours:** (by email appointment)

COURSE GOALS

PURPOSE

The purpose of this course is to provide an introduction to physics, with focus on concepts, (while using Elementary Algebra) as a tool to guide in the understanding of everyday life. Will cover Newtonian Mechanics and Electricity & Magnetism.

OUTCOMES

At the conclusion of the course, the student should have a good working knowledge of general physics concepts and should be able to apply them with confidence in everyday life. For example, the students will be able to answer basic questions such as: *what causes objects to either stay where they are or start moving ? , why are we able to feel “weightless” in outer space ? Or What causes a lightbulb to light-up when we turn ON the switch ?*

INSTRUCTIONAL DELIVERY

In-person/on-campus

CONTINGENCY PLANNING

In the event that a student must shift to online attendance for health reasons, either temporarily or for the remainder of the semester, the student must notify the instructor immediately.

In the event that the university as a whole, or this course in particular, must shift to entirely online course delivery, the following adjustments will be made to the mode of instruction, assignments, and assessments in this course:

Classes will be given at same time, but via Zoom meetings. Link to zoom will be provided if necessary.

INSTRUCTIONAL METHODS AND COURSE REQUIREMENTS

REQUIRED TEXTBOOK

Conceptual Physics, 12th Ed., Paul G. Hewitt

ADDITIONAL RESOURCES

Website link below provides additional resources such as helpful videos/problem-solving tutorials by Paul G. Hewitt to complement lectures in class.

<https://conceptualacademy.com/textbook/conceptual-physics>

HOMEWORK WILL BE POSTED ON A WEEKLY BASIS VIA THE CLASS WEBPAGE; TO BE COMPLETED WITHIN 5-7 DAYS; THE HOMEWORK WILL BE GRADED AS FOLLOWS: ON THE HW DUE DATE, 4 STUDENTS WILL BE CALLED AT RANDOM TO SOLVE ANY ONE OF THE HW PROBLEMS ON THE BOARD WITHIN 3 MINUTES (WITHOUT NOTES). THIS WILL CONSTITUTE 20 % OF THE TOTAL GRADE. A STUDENT MAY BE CALLED MORE THAN ONCE DURING THE SEMESTER.

- <https://yero1990.github.io/cuaPHY101.github.io/>

CLASS POLICIES

- **Attendance**
in-person attendance/participation is **REQUIRED**:
If absent, proof of absence (i.e., medical note, etc.) is **REQUIRED**
MORE THAN 3 unexcused absences will result in an administrative grade of **F***
- **Make-Up Exams Policy**
NO Make-up exams will be given. Make sure you do not have any schedule conflict.
 - ▶ **ONLY in case of EMERGENCY**: If any of the first two midterm exams is missed, it will be dropped and its weight (10%) will be counted towards your second highest exam score for a total weight of 30%. **You will need to provide official note (e.g. doctor's note, etc.) explaining your absence during the exam.**
 - ▶ If both mid-term exams are missed, 30% of your final grade will be dropped (highest final grade you can get is 70%).
 - ▶ If the final exam is missed, it will result in **FAILURE**.

COURSE GRADE BREAKDOWN

THERE WILL BE HOMEWORK + 3 EXAMS, WHICH WILL BE WEIGHTED AS FOLLOWS:

- **Homework/participation** **20 % of final grade**
- **lowest exam score** **10 % of final grade**
- **second highest exam score** **20 % of final grade**
- **final exam score** **50 % of final grade**

THE 3RD (FINAL) EXAM IS CUMULATIVE.

The University grading system is available:

- Undergraduates - <https://policies.catholic.edu/students/academicundergrad/gradesfull.html#ii> for undergraduates
- Graduates - <https://policies.catholic.edu/students/academicgrad/gradesfull.html#iii> for graduate students

Reports of grades in courses are available at the end of each term on <https://csprd.cua.edu/pspr/csprd/?cmd=login&languageCd=ENG&>.

COURSE SCHEDULE & BIBLIOGRAPHY

TENTATIVE COURSE SCHEDULE

January: Chapter 2 - 5

February: Chapters 6 - 8

February 13: Exam I (Ch. 2 - 5)

March: Chapters 9, 10, 22

April 10: Exam II (Ch. 6 - 10)

April: Chapters 23 - 25

TBD (Cumulative Final Exam, Ch. 2-10, 22-25)

CATHOLIC UNIVERSITY POLICIES

UNDERGRADUATE LEVEL

All members of the Catholic University community have a shared responsibility to know and to abide by the University's policies, especially relating to:

- Academic Integrity
- Accommodations for Students with Disabilities
- Attendance
- Conduct
- Final Exams
- Grades and appeals

All of Catholic University's policies are detailed at <https://policies.catholic.edu/index.html>. Please follow up with the instructor if you have any policy-related questions.

Of particular note are the policies regarding Academic Integrity, Accommodations for Students with Disabilities, and Final Exams, which are described below.

ACADEMIC INTEGRITY

Academic dishonesty at The Catholic University of America is not tolerated (<https://policies.catholic.edu/students/academicundergrad/integrityfull.html> and <https://policies.catholic.edu/students/academicundergrad/integrityprocedures.html>)

As such, academic integrity is not merely avoiding plagiarism or cheating, but it certainly includes those things. Academic integrity means, above all else, taking responsibility for your work, your ideas, and your effort, and giving credit to others for their work, ideas, and effort. If you submit work that is not your own – whether test answers, whole papers, or something in-between – that is considered to be academic dishonesty. University procedures related to academic dishonesty are conducted with respect and dignity, while also preserving accountability, and they presuppose that all participants will treat each other with respect and dignity.

The following sanctions are presented in the University procedures related to Student Academic Dishonesty:

“The presumed sanction for undergraduate students for academic dishonesty will be failure for the course. There may be circumstances, however, where, perhaps because of an undergraduate student’s past record, a more serious sanction, such as suspension or expulsion, would be appropriate. ...In the more unusual case, mitigating circumstances may exist that would warrant a lesser sanction than the presumed sanction.”

At times, you may do group work for an in-class presentation or group project. For that *specific* assignment, you are allowed to share material, ideas and information; however, for any related work that is to be submitted on an individual basis, your submission is expected to be your own in its entirety. If there is no group work in the class you should not collaborate with classmates on work that is to be submitted for an individual grade.

For more information about what academic integrity means at CUA, including your responsibilities and rights, visit <https://integrity.catholic.edu/index.html>.

Accommodations for students with disabilities: Any student who feels s/he may need a reasonable accommodation based on the impact of a disability should contact the Office of Disability Support Services (<https://dss.catholic.edu/index.html>) by email at CUA-DSS@cua.edu or call 202-319-5211 to make an appointment to discuss possible accommodations. DSS recommends that a student with a disability meet with DSS staff during the first week of every semester since accommodations are not retroactive. Please note that instructors will only provide those accommodations included in the DSS accommodation letter. DSS is located in PRYZ 127.

Final Exam: The final exam must be given on the day and time assigned by Enrollment Services. Please plan accordingly for travel, work, special events, or appointments.

A student having an exam scheduling conflict as defined in the policy must report to her/his school's Academic Dean's Office no later than fourteen calendar days before the end of classes. The dean will assist the student in rescheduling the exam(s) for the course having the lowest enrollment(s). All make-up exams must be completed at the earliest possible time during the final examination period.

UNIVERSITY RESOURCES

- **Libraries** <https://libraries.catholic.edu/>
- **Center for Academic and Career Success** <https://success.catholic.edu/>
- **Math Center** <https://success.catholic.edu/academic-support/math-center/index.html>
- **Tutoring Services** <https://success.catholic.edu/academic-support/tutoring-services/index.html>
- **Writing Center** <https://success.catholic.edu/academic-support/writing-center/index.html>
- **Office of Disability Support Services** <https://dss.catholic.edu/index.html>
- **Counseling Center** <https://counseling.catholic.edu/index.html>
- **Student Health Services** <https://health.catholic.edu/index.html>
- **Dean of Students Office** <https://deanofstudents.catholic.edu/index.html>