Professor: Scott M. LaBrake Ph.D.
Email: labrakes@union.edu
Office Hours: MWF: 10:30^{am} – 12:30^{pm}
Th: 11:00^{am} – 12:30^{pm}
by appointment
Web: http://minerva.union.edu/labrakes
Text: Openstax University Physics Volume 1
Homework: https://reg.theexpertta.com/USU34NY-F3A433-3TK

Course: Physics 120 Winter 2026
Phone: 6053 & 6562
Office: ISEC 119 & ISEC 072

Course:

This course serves as an introduction to those basic concepts of physics that form the foundation of all the natural sciences. The first of a two-course sequence in Physics this course serves to introduce the student to the fundamental laws of classical mechanics and are applied to a variety of simple systems. Throughout the course the conservation laws serve as unifying physical principles. Mathematics, a powerful tool in the understanding of natural phenomena, assumes its natural role.

Attendance:

While attendance is not mandatory, it is expected that you will attend class on a regular basis. Material will be covered in a rapid fashion over the winter term, covering about one chapter per week. Experience dictates that your success in this class is directly proportional to your attending and active participation with the material. Attendance at all scheduled exams and labs is mandatory and the instructor does reserve the right to lower a grade due to excessive absences.

Course Grade:

Your course grade will be determined based on a professional judgment of your work on the following scale:

Homework	10%
Surveys	5%
Three In-Class Exams	30%
Final Exam	35%
Lab	20%

The overall class average at the end of the term will generally be set to a ***B***$^{-}$ letter grade. ***No letter grades are ever assigned to any individual work.*** An attempt will be made after every exam to give you a ***rough idea*** of an ***overall*** grade based on all work completed to date if a grade were to be assigned at that time, based on the class average of a B^{-}.

Learning Objectives:

This course aims to provide students with a strong foundation in the fundamental principles of physics and the skills necessary to apply these principles to solve problems and make informed decisions in their academic and professional pursuits. Specific course objectives are as follows:

- Develop an understanding of the fundamental principles of physics and how they apply to other disciplines such as biology, chemistry, medicine and society.
- Develop critical thinking and problem-solving skills that can be applied to physics and other disciplines such as biology, chemistry, geology, engineering, medicine and society.
- Apply mathematical tools to solve problems including algebraic manipulation and graphical analysis.
- Develop effective laboratory skills and an ability to design and conduct experiments to test hypotheses.
- Work collaboratively and communicate scientific ideas both verbally and in writing.
- Appreciate the role of physics in modern society and its contribution to technology and innovation.

Textbook Reading Assignments:

- Readings will generally be assigned every class, and you should check the homework webpage to see what the days reading assignment will be.
- The readings listed should be done before each class lecture so that you have some idea about what will be covered.
- You will get more out of the lecture if you have looked over (not necessarily understood) the material to be covered.
- This way you can also come to class with questions about the material being covered and more actively participate in the lecture.

Surveys/Reflections:

- Surveys/reflections will be required every Monday of the term.
- The surveys/reflections are designed for you to reflect on the week's classes, what material was easily understood, what material you struggled with, homework difficulties, and the time and effort that you are have been putting into the class.
- The surveys/reflections are binary graded.
- The surveys are due at the beginning of class and late surveys are not accepted. Please print out your survey/reflection answers and bring them to class every Monday.

Homework:

- The homework assignments are representative of the topics that will be highlighted throughout the term. It is strongly advised that you do the suggested homework as noted in class and other relevant problems, of your choosing, on the covered topics from the text. ***Variations*** of the assigned and unassigned homework are highly probable candidates for the quizzes and the exams.
- The homework will be assigned and graded using an online homework grading system called TheExpertTA and to sign up please visit: https://reg.theexpertta.com/USU34NY-F3A433-3TK. The class section should say Phy120 Winter 2026 LaBrake.
- Homework assignments will be given on Monday, Wednesday, and Friday and you will have access

from 8:00^{am} the day the assignment is made, and the assignment will soft close at 10:00^{pm} the next class day. Adjustments may be made throughout the term to this schedule. I will keep you advised.

- No extensions are given on the homework as the close date/time for the homework is not a hard limit. You may still work on the homework after the close day/time. There is a 2% late penalty per day assessed after the close date/time for late work submitted.
- Hints for the homework: I would advise you talk to me, your classmates, the Physics Crisis Center (which is open on Tuesday and Thursday evenings from 7^{pm} – 10^{pm} throughout the term), or just ponder the question for a day or so. ***Too often students confuse reading the solution to the problem with their actual understanding of the problem***. The mathematical complexity of this course is limited to your ability to do algebra as well as basic mathematical operations.

Labs:

All labs must be attended. Everyone in Physics 120 must complete the laboratory sequence. ***You cannot pass the course without having passed the lab, which requires earning a minimum grade of 70%.*** The format for the lab write-ups will be discussed when we have our first laboratory class.

Exams:

- There will be three (3) in-class exams, approximately one (1) hour each, and a cumulative two (2) hour final exam. The hour exams are scheduled for ***Friday, January 23, Friday, February 13, and Friday, March 6***. Each hour exam will not be cumulative; however, they will be based on your prior knowledge.
- The hour exams are given on the dates listed and will not be changed for any reason. Please plan accordingly in your other classes.
- ***Emphasis will be placed on demonstration of the ability to apply the concepts and techniques learned to new situations.***
- If you cannot make a scheduled exam, then it is your responsibility to contact the instructor ***in person a minimum of at least 24 hours in advance of the exam.***
- ***Make-up exams may be granted only in exceptional and well documented cases, as determined solely by the instructor and the Dean of Studies (DOS). You should provide the documentation to substantiate your absence to the DOS and if the DOS determines that the absence is valid, the DOS will email all of your instructors. After this happens, a make-up exam will be scheduled at the convenience of the instructor. No make-up exams will be scheduled otherwise.***
- ***Not feeling well, being seen by the Wicker wellness center, or not feeling prepared on the day of the exam not an acceptable reason for missing an exam.***
- The final exam will be cumulative and no make-up exam will be given for any reason. The date and time of the final is set by the Registrar and will be Monday, March 16, 2026 from 8:30^{am} – 10:30^{am} in ISEC120. ***This is the only time that the final exam will be given***.

Diagnostic Tests

- Diagnostic tests will be administered at the beginning (pre-test administered one evening in ISEC120 during the first week of classes) and end (post-test administered one evening in ISEC120 during the last week of the classes) of the term to help the department of Physics and Astronomy assess the effectiveness of the course. Your scores on these diagnostic tests will have no effect on your grade for the course. You will receive an email about the date/time of the DTs.

Students with Disabilities: If you have a specific disability that qualifies you for academic accommodations, please provide appropriate documentation from Disability Services well before the first assessment (generally within the first week of the term and before the first timed assignment) and then we can meet to discuss any necessary special arrangements or needs.

Academic Honesty Issues: Union College recognizes the need to create an environment of mutual trust as part of its educational mission. Responsible participation in an academic community requires respect for and acknowledgment of the thoughts and work of others, whether expressed in the present or in some distant time and place.

Matriculation at the College is taken to signify implicit agreement with the Academic Honor Code, available at *honorcode.union.edu*. It is each student's responsibility to ensure that submitted work is his or her own and does not involve any form of academic misconduct. Students are expected to ask their course instructors for clarification regarding, but not limited to, collaboration, citations, and plagiarism. Ignorance is not an excuse for breaching academic integrity.

Students are also required to affix the full Honor Code Affirmation, or the following shortened version, on each item of coursework submitted for grading: "*I affirm that I have carried out my academic endeavors with full academic honesty.*" [Signed, Jane Doe]

Some general honor code comments:

1. For homework I assume that you will be working together on the homework problems. I consider the homework assignments as a pedagogical tool – one for you to learn, apply, and expand upon the techniques studied in class. ***The effort of learning the material from the homework is your own responsibility***. Thus, you can work together on the homework, but should write up your own solutions so that you can learn it better and so that you will know how to approach the problems on the quizzes and exams.
2. For quizzes and exams, you are not allowed to work together. The quizzes and exams are closed book, and you are only allowed to use a calculator (specifically one that is not associated with any type of portable communication device) and the instructor provided equation sheet. You ***may not use*** your own equation sheet.

Tentative Schedule

Week	Material
1	Vectors and Motion in a Straight Line
2	Motion in 1 & 2D
3	Motion in 2 & 3D and Forces
4	Forces and Motion
5	Forces and Motion
6	Work and Energy
7	Conservation of Energy
8	Center of Mass, Linear Momentum & Collisions
9	Rotational Motion & Rotational Energy
10	Equilibrium and Elasticity