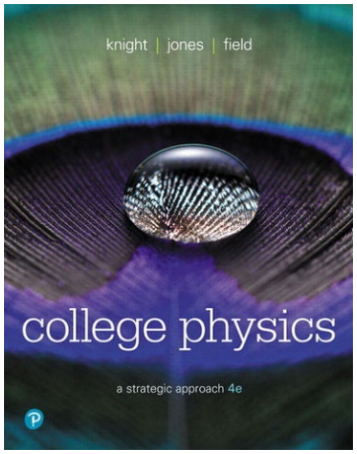
COLLEGE PHYSICS 1 – PHY 2053
COURSE SYLLABUS, FALL 2023

Course Information:

- PHY 2053 (81167), 3 lecture contact hours for 3 credit hours
- The pre-requisites for this course are MAC 1114 and MAC 1140
- The co-requisites for this course are PHY 2053 L
- The **textbook *and* Mastering Physics access** are **required** for the course
- The **required** text book is College Physics: A Strategic Approach, 4th edition, by Knight, Jones, and Field. Publisher: Pearson, published 2018, © 2019.
- Some book options:
  - ISBN: 9780134609034 (hardback text available in bookstore), must purchase Mastering access separately from Pearson online **OR**
  - ISBN: 9780134700502 (loose leaf), must purchase Mastering access separately from Pearson online **OR**
  - ISBN: 9780134703930 (eText ***with*** Mastering Access included for 24 months). This is the cheapest option.
- There is a picture of the book cover below and right.
- A scientific calculator or graphing calculator is necessary. For any exams taken in the testing center, a scientific calculator will be the only type of calculator permitted.
- Topics covered include motion, vectors, Newton's Laws, equilibrium, momentum, energy, properties of matter, and oscillations.



Instructor Information / Other Contacts:

- Jessica Edwards, Ph.D. Physical Chemistry, Astronomy minor, B.S. Astrophysics, Chemistry minor
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  Office: Natural Sciences A-116
  Phone: 850-769-1551 ext. 6020
- **Canvas message is BEST way to contact me.**
  Response time: one **business** day
- Student office hours: 10 hours per week
- Division Chair: Fledia Ellis, fellis@gulfcoast.edu, 850-872-3848
- Administrative Assistant: Kathy Bleday, kbleday@gulfcoast.edu, 850-872-3851
- Campus Safety contact: David Thomassee, dthomasee@gulfcoast.edu, 850-873-3582

Course Description: Selected topics from mechanics and thermodynamics. Application is towards non-engineering fields.

This course is designed for students who are a life or a biological science major. This physics course will provide a background understanding of the principle involved in your work. Even though the applications of the laws of physics may not be immediately obvious, understanding them can be a valuable tool.

Broad Goals of the Course:

1. gaining factual knowledge in physics (terminology, classifications, methods, trends)
2. learning fundamental principles, relationships, generalizations, and theories
3. learning to apply course material (to improve thinking, problem solving, and decision making)

In-class content delivery: Lectures are traditional lecture style. A lot of time is spent using the white board. Lectures may consist of presentations, discussion, worked example problems, group activities, and individual assessments. They will occur in the designated classroom during the scheduled class time and will include periodic assessments that contribute to the final grade. Office hours will be in the office and tutor lab. Exams will be taken in-person on campus.

Attendance:

- Regular class attendance and participation are **essential** to your success in this course. Attendance will be taken at the beginning of each class.
- ***Daily*** monitoring of the Course shell in Canvas, and your GCSC email account, is essential for obtaining course-related information. Course supplements, and important announcements for this course **will be posted to Canvas**. Failure to check Canvas is ***NOT*** a valid excuse for not receiving information communicated via this pathway.
- If you are absent from class, you are responsible for collecting missed lecture notes from fellow students and then bring specific questions to your instructor during office hours.
- *You* are responsible for ALL missed material.
- Punctuality is important. Showing up late can be a disruption. If this happens regularly, you will be required to talk to the Division Chair of Natural Sciences.

Withdrawal Procedure:

- Students may withdraw themselves only BEFORE the scheduled deadline as Published on the college academic calendar.
- Students that wish to withdraw must complete a withdrawal form and submit it to the Office of Enrollment Services.
- Your instructor will NOT initiate withdrawals.
- Withdrawals prior to the scheduled deadline will be recorded as a "W". After the deadline, a standard grade will be assigned.
- Your last day to withdraw is **October 20th.**

Participation:

- Regular course participation is essential to your success in this course. Participation will be monitored in class and through Canvas.
- This is a face to face course and attendance is required, however, should a situation arise where you have to quarantine or cannot come to class because you are sick, direction and guidance (to the best of my ability) will be provided for you to complete on your own. Do NOT abuse this.
- Missing class is the fastest way to feeling overwhelmed with Physics.

Academic integrity + miscellaneous:

- There is a ZERO TOLORENCE policy for cheating/plagiarizing in this course. Cheating or copying on homework problems, quizzes, exams, or lab reports can result in a zero on the given assignment and even a failing grade in the course.
- **Searching/using the internet or AI for homework solutions IS CHEATING** and will be treated as such. Using online sources or solution manuals only hurts you in the long run. You will not learn the material correctly if you are looking at someone else's result instead of chewing on the problem yourself. This struggle will follow you into your future courses because you haven't developed the base you need.
- If you're acing the homework, but that is not reflected on your exam grades, then please feel free to set up a meeting with me so we can discuss your study habits and figure out how to improve your exam results.
- You may be required to sign an academic integrity policy to participate in this course.
- **To succeed in a 3-credit hour University-level course, you should expect to spend roughly 9 hours a week (outside of your regular class time) studying, taking notes, and doing the assignments.**

Tests:

Tests	Chapters
Unit 1	1, 2
Unit 2	3, 4
Unit 3	5, 6
Unit 4	7, 8
Unit 5	9, 10
Unit 6	11, 12
Unit 7	13, 14
Final Exam	Cumulative

Homework:

- Homework will include online assignments, and may also include questions from the text, or questions given out during class.
- Online homework will be completed via Mastering Physics (required).
- Worked out problems will be assigned specifically and must be handwritten with *all work shown*.
- Late homework will not be accepted (unless you have approval of the professor).
- Put your full name, clearly printed on the upper right side.
- Your homework should be **in order** and **clearly labeled.**
- **You will not get credit for worked out problems if you do not show your work. You will not get credit if your professor can not read your writing.**

Quizzes/pre-lecture book notes:

- Quizzes, worksheets, and pre-lecture book note checks will be given throughout the semester.
- Pre-lecture book notes are notes that you have taken **(hand-written, NOT typed)** yourself from the book *BEFORE* the scheduled lecture. Pre-lecture book notes will **NEVER** be accepted late.
- Quizzes, worksheets, and pre-lecture book note checks will be announced on Canvas.

Grading:

• **Regular semester exams** are worth **60%** of your total course grade. The lowest regular exam grade will be dropped. (The final exam is NOT a regular exam.)
• **Homework** is worth **9%** of the course grade.
• **Quizzes, and pre-lecture book note checks** are worth **9%** of the course grade.
• The **Final Exam** counts for **22%** of the course grade. (Equivalent of ~ 2 tests)

*Note: these percentages mean that if you get 100% on all the exams and the final, but you don't do any homework, quizzes, or book notes, the maximum you will get in the course is an 84%, i.e. it is impossible to get an "A" in this course if you don't do the work. Homework, quizzes, and book notes are worth 16% of your course grade (this is over a full letter grade).

Letter Grade	Overall Percent
A	≥90
B	89-80
C	79-70
D	69-60
F	<60

Student Accessibility Statement:

- Gulf Coast State College supports an inclusive learning environment for all students. If there are aspects of the instruction or design of this course that hinder your full participation, reasonable accommodations can be arranged. Prior to receiving accommodation, you must register with Student Accessibility Resources. Appropriate academic accommodations will be determined based on the documented needs of the student. For information regarding the registration process email sar@gulfcoast.edu or call 850-747-3243.

PaperCut

- The PaperCut print management client is installed in all computer labs. The PaperCut user web console is accessed through the MyGCSC portal. The logon is the first part of your student email address, everything before the @mygulfcoast.edu. Students will be required to add money to their PaperCut accounts before they are able to print. Money can be added to student print accounts by cash, credit, or debit card. Cash is accepted at PaperCut kiosks located in the Library. Credit and debit card payments, minimum $5.00, can be made through the "add credit" tab on the PaperCut user web console. Instructions for the use of PaperCut are located at https://www.gulfcoast.edu/administration-departments/information-technology-services/printing/

HB233

- In accordance with federal and state privacy laws, students may record class lectures for their own personal educational use, in connection with a complaint to the college, or as evidence in internal or external legal proceedings. Students may not publish or upload the recordings or any components thereof without the knowledge and written permission of the faculty member. Failure to obtain permission to publish could lead to the students' having to pay damages, attorney fees, and court costs. For more information about what can be recorded, please see the guidelines in the GCSC Student Handbook: https://www.gulfcoast.edu/current-students/student-handbooks/2020-2021-student-handbook.pdf.

Learning Objectives

- Chapter 1: Representing Motion
  - 1.1 - Draw and interpret motion diagrams to represent motion.
  - 1.2 - Describe motion in terms of position, velocity, and time.
  - 1.3 - Calculate the speed and velocity of an object.
  - 1.4 - Use scientific notation.
  - 1.5 - Express quantities with the appropriate units and the proper number of significant figures.
  - 1.6 - Perform unit conversions.
  - 1.7 - Describe motion using vectors and trigonometry.

- Chapter 2: Motion in One Dimension
  - 2.1 - Use motion diagrams to interpret motion.
  - 2.2 - Use and interpret motion graphs.
  - 2.3 - Calculate the velocity of an object.
  - 2.4 - Solve problems about an object in uniform motion.
  - 2.5 - Calculate the acceleration of an object.
  - 2.6 - Determine and interpret the sign of acceleration.
  - 2.7 - Use the problem-solving approach to solve problems of motion with constant acceleration and free fall.

- Chapter 3: Vectors and Motion in Two Dimensions
  - 3.1 - Add and subtract vectors graphically.
  - 3.2 - Use vectors and motion diagrams to find acceleration.
  - 3.3 - Perform vector calculations using vector components.
  - 3.4 - Solve problems about an object moving on a ramp.
  - 3.5 - Understand and use relative velocity.
  - 3.6 - Solve problems for projectiles that follow parabolic trajectories.
  - 3.7 - Calculate and use centripetal acceleration.

- Chapter 4: Forces and Newton's Laws of Motion
  - 4.1 - Recognize and identify the forces acting on an object.
  - 4.2 - Combine multiple forces acting on an object.
  - 4.3 - Draw a free-body diagram.
  - 4.4 - Understand the connection between force and motion.
  - 4.5 - Use Newton's second law.
  - 4.6 - Identify action/reaction pairs of forces on interacting objects.

- Chapter 5: Applying Newton's Laws

  - 5.1 - Solve problems about objects in equilibrium.
  - 5.2 - Use free-body diagrams, Newton's second law, and the problem-solving approach to solve dynamics problems.
  - 5.3 - Work with and distinguish between mass and weight.
  - 5.4 - Solve problems with sliding and rolling friction; understand how static friction can prevent motion.
  - 5.5 - Use the linear and quadratic models of drag to solve problems about motion through a fluid and to calculate terminal speeds.
  - 5.6 - Use Newton's third law to identify forces on and to solve problems about interacting objects.
  - 5.7 - Calculate the tension in ropes and solve problems involving ropes and pulleys.

- Chapter 6: Circular Motion, Orbits, and Gravity

  - 6.1 - Calculate period, frequency, and speed for objects in circular motion.
  - 6.2 - Use Newton's laws to solve dynamics problems for objects in uniform circular motion.
  - 6.3 - Understand the apparent weight of an object in circular motion.
  - 6.4 - Analyze the circular orbits of planets and satellites.
  - 6.5 - Use Newton's law of gravity to calculate long-range gravitational forces.
  - 6.6 - Solve problems about gravity and orbits.

- Chapter 7: Rotational Motion

  - 7.1 - Calculate angular velocity and interpret motion graphs for rotational motion.
  - 7.2 - Calculate angular acceleration and tangential acceleration.
  - 7.3 - Calculate the torque exerted on an extended object.
  - 7.4 - Determine an object's center of gravity and gravitational torque.
  - 7.5 - Calculate an object's moment of inertia.
  - 7.6 - Use Newton's second law for rotational motion to solve problems about rotational dynamics
  - 7.7 - Analyze rolling motion.

- Chapter 8: Equilibrium and Elasticity

  - 8.1 - Use force and torque to solve static equilibrium problems.
  - 8.2 - Determine an object's stability.
  - 8.3 - Use Hooke's law to calculate the force exerted by a spring.
  - 8.4 - Use stress, strain, and Young's modulus to calculate the elastic properties of materials.

- Chapter 9: Momentum

  - 9.1 - Calculate the momentum of and impulse on an object.
  - 9.2 - Use the impulse-momentum theorem to solve impulse and momentum problems.
  - 9.3 - Use Problem-Solving Approach 9.1 to solve conservation of momentum problems.
  - 9.4 - Apply conservation of momentum to collisions and explosions.
  - 9.5 - Use momentum in two dimensions.
  - 9.6 - Understand and use angular momentum and its conservation.

- Chapter 10: Energy and Work

    - 10.1 - Calculate the work done on an object.
    - 10.2 - Calculate an object's kinetic and potential energy.
    - 10.3 - Understand and calculate the change in thermal energy.
    - 10.4 - Use the problem-solving approach to solve conservation of energy problems.
    - 10.5 - Draw and interpret energy diagrams.
    - 10.6 - Interpret and use molecular bond energies.
    - 10.7 - Apply energy and momentum conservation to elastic collisions.
    - 10.8 - Understand and calculate power.

- Chapter 11: Using Energy

    - 11.1 - Identify transformations of energy and calculate their efficiencies.
    - 11.2 - Understand how energy is used and stored in the body.
    - 11.3 - Distinguish between work, heat, temperature, and thermal energy.
    - 11.4 - Apply the first law of thermodynamics to heat engines, heat pumps, and refrigerators.
    - 11.5 - Understand the concept of entropy and the limitations that the second law of thermodynamics places on energy transformations.

- Chapter 12: Thermal Properties of Matter

    - 12.1 - Work with moles and atomic masses.
    - 12.2 - Understand the atomic model of gas temperature and pressure.
    - 12.3 - Use the ideal-gas law, pV diagrams, and the first law of thermodynamics to solve problems about ideal-gas processes.
    - 12.4 - Calculate the thermal expansion of solids and liquids.
    - 12.5 - Solve calorimetry and phase-change problems for solids, liquids, and gases.
    - 12.6 - Calculate the rate of heat transfer via conduction and radiation.
    - 12.7 - Use random walks and Fick's law to solve problems about the diffusion of gases and liquids.

- Chapter 13: Fluids

    - 13.1 - Work with the density of gases and liquids.
    - 13.2 - Calculate and use the pressure in a liquid.
    - 13.3 - Use Archimedes' principle to understand buoyancy.
    - 13.4 - Use the equation of continuity to solve problems about fluid flow.
    - 13.5 - Use Bernoulli's and Poiseuille's equations to solve problems about fluid dynamics.
    - 13.6 - Understand the motion of blood in the circulatory system.

- Chapter 14: Oscillations

    - 14.1 - Work with the period, frequency, and amplitude of oscillatory motion.
    - 14.2 - Use the graphical and mathematical representations of simple harmonic motion.
    - 14.3 - Apply energy conservation to simple harmonic motion.
    - 14.4 - Solve problems about simple and physical pendulums.
    - 14.5 - Use the concepts of damping and resonance.