PENSACOLA STATE COLLEGE

Physics with Calculus I – Section Syllabus
PHY 2048, Section P1177
Fall 2025, Session A

Instructor: Dr. R. Evan McClellan
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Final Exam Date: TBD
Last Date of Drop/Add: August 22, 2025
Last Date for Student to Withdraw: November 4, 2025

Course Description: This calculus-based course serves as the first in a two-part series, covering topics like kinematics, dynamics, energy, momentum, rotational motion, fluid dynamics, oscillatory motion, and waves. Designed for science and engineering majors, the course integrates critical thinking, analytical skills, and real-world applications.

Class Meeting Time: T Th | 11:00 AM - 12:50 PM
Class Location: Pensacola Campus, Building 17, Room 1777
Semester Hours: 4 credit hours

Corequisites: MAC 2312, PHY 2048L

Offered: Fall, Spring

Course Designations: College Transfer. Meets AA General Education Core, Natural Sciences (Physical Sciences) requirement.

General Education Core Course Standard: Per Florida Statute 1007.25, “Natural science courses must afford students the ability to critically examine and evaluate the principles of the scientific method, model construction, and use the scientific method to explain natural experiences and phenomena.”

Required Textbooks and Instructional Materials: available online, for free: University Physics; Ling, Sanny, Moebs; 1938168275; 1; Openstax; 2016

Supplemental Materials: Scientific or Graphing Calculator

Methods of Evaluation: At minimum, the instructor will cover content which aligns with statewide and institutional learning outcomes for the course. The instructor will measure student performance using the following:

Grade calculation: Your final grade is based on your (1) Homework, (2) Quizzes, and (3) Exams

Percentage break-down:	Homework:	15%
	Chapter Quizzes:	15%
	Exams (3 Tests + Final):	70%

Grade Point Average:

A (90−100%)	B+ (87−90%)	B (80−87%)	C+ (77−80%)
C (70−77%)	D+ (67−70%)	D (60−67%)	F (< 60%)

Student Expectations: Students enrolled in this course can expect the following:

1. Clearly identified course objectives;
2. Productive class meetings;
3. A positive learning environment;
4. Opportunities for appropriate student participation;
5. Effective instruction;
6. Positive and appropriate interactions;
7. Assistance with meeting course objectives during and beyond class hours;
8. Evaluation of student performance and appropriate and timely feedback; and
9. Clear and well-organized instruction.

Course Learning Outcomes:

1. Describe the motion of objects moving at constant velocity or constant acceleration.
2. Find the magnitude and direction of the resultant vector obtained by adding several vectors.
3. Find the horizontal range of a projectile.
4. Write Newton's Laws of motion and Gravitation.
5. Describe and understand the concept of inertia.
6. Explain the difference between static and kinetic friction.
7. Draw a complete free-body diagram for a typical mechanics problem.
8. Apply Newton's 2nd Law to analyze the motion of an object along an inclined plane.
9. State and know how to apply the Work-Energy Theorem.
10. Compute the kinetic energy of a moving body.
11. Find the gravitational potential energy of a body near the surface of the Earth.
12. Apply the Law of Conservation of Energy.
13. Locate the center of mass of a rigid body.
14. Find the linear momentum of a moving body.
15. Write down the linear impulse-momentum principle.
16. Apply the law of conservation of linear momentum to analyze elastic, inelastic and plastic collisions of particles.
17. Compute the thrust of a rocket.
18. Find the angular velocity, angular acceleration and centripetal force acting on a body moving in a circular path.
19. Apply Kepler's Laws and conservation of angular momentum to describe the motion of a comet.
20. Understand the concepts of torque and moment arm.
21. Find the moment of inertia of a solid sphere.
22. Use the reference circle model to describe the vibrational motion of an oscillating system.

23. Compute the heat exchanged during a process where a phase change occurs.
24. List and describe the three basic processes of heat transfer.
25. Apply the 1st law of thermodynamics to find the temperature change in an adiabatic process.
26. Apply the 2nd law of thermodynamics to find the efficiency of a Carnot engine.

General Education Student Learning Outcomes:

Critical Thinking: The student analyzes, evaluates, and, if necessary, challenges the validity of ideas, principles, or data in order to develop informed opinions, probable predictions, or defensible conclusions.
Scientific and Mathematical Literacy: The student properly identifies and applies scientific or mathematical principles and methods.
Information Literacy: The student effectively locates, evaluates, and applies information from a variety of sources.

Academic Dishonesty Statement: Pensacola State College is committed to upholding the highest standards of academic conduct. All forms of academic dishonesty, to include plagiarism and cheating, are prohibited. Penalties for academic dishonesty include but are not limited to one or more of the following: the awarding of no credit on the assignment, a reduction in the course grade, or the assignment of a final course grade of F and removal from the course. See the *College Catalog* for more details: https://catalog.pensacolastate.edu/content.php?catoid=2&navoid=47#academic-honesty

Student Email Accounts: Pensacola State College provides an institutional email account to all students enrolled in courses for credit. This institutional email account is the official method of communication, and students must use this account when communicating with the College. In cases where companion software is used for a particular class, email may be exchanged between instructor and student using the companion software.

Flexibility: It is the intention of the instructor to accomplish the objectives specified in the course syllabus. However, circumstances may arise which prohibit the fulfilling of this endeavor. Therefore, this syllabus is subject to change. When possible, students will be notified of any change in advance of its occurrence.

ADA Statement: Students with a disability that qualifies under the American with Disabilities Act Amendments Act of 2008 (ADAAA) must self-identify with the Student Resource Center for ADA Services (SRC/ADA). Disabilities covered by the ADAAA may include learning, psychiatric, physical disabilities, or chronic health disorders. Students can contact SRC/ADA if they are not certain whether a medical condition/disability qualifies. SRC/ADA is located on the Pensacola campus in building 6, room 603, ADA-services@pensacolastate.edu, 850-484-1637. Students may also complete the online intake form in the ADA Services app within the PSC apps dashboard.

Equity Statement: Pensacola State College does not discriminate against any person on the basis of race, ethnicity, national origin, color, gender/sex, age, religion, marital status, pregnancy, disability, sexual orientation, gender identity, or genetic information in its educational programs, activities, or employment. For inquiries regarding Title IX and the College's nondiscrimination policies, contact the Dean of Students at (850) 484-1759, Pensacola State College, 1000 College Blvd., Pensacola, Florida 32504.

Security Statement: Pensacola State College is committed to encouraging all members of the College community to be proactive in personal safety measures. In case of emergency, students should ensure that

they are aware of the building exit closest to each of their classrooms, as well as all alternative building exits in case circumstances require using a different route.

Emergency Statement: In the case of severe weather or other emergency, the College administration maintains communication with appropriate state and local agencies and makes a determination regarding the cancellation of classes. Notices of cancellation will be made through the College's PSC Alert system and on the College's website.