

Welcome to PHY2048 – Physics 1 with Calculus

Physics 1 is an essential foundation course for many degree programs at Florida Polytechnic University. In this course, you will learn the fundamentals of mechanics and waves while developing a deep conceptual understanding of key ideas in physics. Physics 1 introduces mathematical concepts specifically tailored for science and engineering majors. The course emphasizes critical thinking, analytical skills, and practical applications in the real world. It is designed to be both fair and challenging.

Success in Physics 1 requires regular attendance and a consistent work ethic. Taking a serious and professional approach to studying and doing homework is the best way to ensure you meet the learning outcomes for the course. Be familiar with the academic policies outlined on this syllabus and see your instructor with any questions or concerns.

Course Information

- **Course Number and Title:** PHY 2048 Physics 1
- **Credit Hours:** 3 (lecture)
- **Academic Term:** Spring 2026

Course Meeting Information

Section	Instructor	Meeting Time	Room
1	Dr. Liu	MWF 8:00-8:50 am	IST 1003
2	Dr. Bentley	MWF 9:00-9:50 am	IST 1003
3	Dr. Hermann	MWF 10:00-10:50 am	IST 1003
4	Dr. Barker	MWF 11:00-11:50 am	IST 1003
5	Dr. Eckert	MWF 1:00-1:50 pm	IST 1003
6	Dr. Eckert	MWF 2:00-2:50 pm	IST 1003
7	STAFF	MWF 3:00-3:50 pm	IST 1003

Instructor Contact and Office Hours

Here is the schedule for office hours. Feel free to come to any office hours to discuss concepts or for coursework help. Please contact your section instructor for questions about specifics discussed in lecture or about grades.

All office hours will be in the instructor's office listed in the table below.

Sections	Instructor	Email and Office	Monday	Tuesday	Wednesday	Thursday	Friday
1	Dr. Liu	hliu@floridapoly.edu IST 2108					
2	Dr. Bentley	ibentley@floridapoly.edu BARC 2228					
3	Dr. Hermann	nhermann@floridapoly.edu BARC 2276					
4	Dr. Barker	bbarker@floridapoly.edu BARC 2271					
5&6	Dr. Eckert	seckert@floridapoly.edu IST 2104					
7	STAFF						

Course Details

Official Catalog Course Description:

- **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.
- **Prerequisites:** MAC 2311 - Analytic Geometry and Calculus 1
- **Co-requisite:** PHY 2048L - Physics 1 Laboratory

Required Texts and Materials:

- **Required Text:** **University Physics Volume 1 OpenStax**, freely available at: <https://openstax.org/details/books/university-physics-volume-1>
- **Equipment and Materials:** TI-30XIIS Scientific calculator (required for homework, quizzes, and exams). Canvas (for Homework, Instructor Notes, Practice Tests, and Grades). University Email for any relevant reminders and updates.

Course Objectives:

 This course (through lecture, student coursework, etc.) is intended to:

- **Define** physical concepts (e.g., motion, vectors, force, energy, momentum, rotation, equilibrium, and oscillations),
- **Develop** processes for interpreting physics question prompts to turn them into actionable problems, and
- **Demonstrate** methodologies to derive a clear and concise solution from provided information.

Course Learning Outcomes:

 Upon completion of the course, students should be able to

- **Identify** physically relevant equations and **demonstrate** mathematical skills required to manipulate those,
- **Apply** physics concepts to solve problems based on real world situations,
- **Integrate** scientific communication tools (tables, graphs, etc.) with the underlying physics concepts, and
- **Create** accurate solutions that are relevant to the real world based on physical principles.

Alignment with Program Outcomes:

Program Learning Outcomes and General Education Competencies may be found in the Academic Catalog (<http://catalog.floridapoly.edu/>).

Student Learning Outcomes (SLO) Table

Course Learning Outcome	Learning Level	Program Learning Outcome (ABET)
Identify physically relevant equations and demonstrate the mathematical skills required to manipulate those.	Remember and Recognize Recall	1 an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
Apply physics concepts to solve problems based on real-world situations.	Apply and Analyze Execute Implement Differentiate Organize	1 an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
Integrate scientific communication tools (tables, graphs, etc.) with the underlying physics concepts.	Understand Interpret Compare Explain	3 an ability to communicate effectively with a range of audiences
Create accurate solutions that are relevant to the real world based on physical principles.	Evaluate Check Critique	1 an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics 4 an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts

Course Schedule

The two-course schedules listed below are tentative and subject to change as a result of extreme weather, changes made by the registrar's office or for some other unforeseen reasons. Any updates to these schedules will be announced in class and on Canvas.

- Important Dates: <https://floridapoly.edu/academics/academic-calendar/index.php>

Dates Weekly Lecture Topics	Monday	Wednesday	Friday
1/12-1/16 Units	Ch 1.1	Ch 1.2-1.4 Reading 1	Ch 1.5-1.7 Homework 1A
1/19-1/23 Vectors	MLK No Classes	Ch 2.1-2.2 Homework 1B	Ch 2.3 Reading 2
1/26-1/30 1-D Motion	Ch 2.4 Homework 2A	Ch 3.1-3.3 Homework 2B	Ch 3.4-3.5 Reading 3
2/2-2/6 2-D and 3-D Motion	Ch 3.6 Homework 3A	Ch 4.1-4.2 Homework 3B	Ch 4.3 Reading 4
2/9-2/13 Newton's Laws	Ch 4.4 Homework 4A	Ch 5.1-5.3 Homework 4B	Exam 1 Review Reading 5
2/16-2/20 Applications of Newton's Laws	Ch 5.4-5.5 Exam 1 (Ch 1-4)	Ch 5.6-5.7 Homework 5A	Ch 6.1 Homework 5B
2/23-2/27 Energy	Ch 6.2 Reading 6	Ch 6.3 Homework 6A	Ch 7.1-7.2 Homework 6B
3/2-3/6 Conservation	Ch 7.3 Reading 7	Ch 7.4 Homework 7A	Ch 8.1-8.2 Homework 7B
3/9-3/13 Momentum	Ch 8.3 Reading 8	Ch 8.4 Homework 8A	Exam 2 Review Homework 8B
3/10-3/14 Rotation	Ch 9.1-9.3 Exam 2 (Ch 5-8)	Ch 9.4, 9.6 Reading 9	Ch 10.1-10.3 Homework 9A
3/16-3/20 Spring Break	Spring Break No Classes	Spring Break No Classes	Spring Break No Classes
3/23-3/27 Statics	Ch 10.4 Homework 9B	Ch 10.6-10.7 Reading 10	Ch 11.1-11.2 Homework 10A
3/30-4/3 Gravity	Ch 11.3 Homework 10B	Ch 12.1 Reading 11	Ch 12.2 Homework 11
4/6-4/10 Fluids	Ch 13.1-13.2 Reading 12	Ch 13.3-13.4 Homework 12	Exam 3 Review Reading 13
4/13-4/17 Oscillations	Ch 14.1-14.3 Exam 3 (Ch 9-12)	Ch 14.4 Homework 13	Ch 14.5-14.6 Reading 14
4/20-4/24 Waves & Interference	Ch 15.1-15.2 Homework 14A	Ch 15.3-15.4 Homework 14B	Ch 15.4 Reading 15
4/27-4/28 Final Review	Final Review Homework 15	Reading Days	
5/4-5/8 Finals Week	Final Exam	(cumulative, with an	emphasis on Ch. 13, 14, 15)

Course Policies

Requirements and Evaluation

Your grade will be based on:

- (5%) participation and attendance (in class),
- (5%) reading assignments (on Canvas),
- (20%) homework assignments (also on Canvas),
- (5%) quizzes (in class),
- (45%) three exams: 15% each, and
- (20%) final exam (all common exams scheduled out of class).

Attendance and Participation

- Students in this course are expected “to attend all of their scheduled University classes and to satisfy all academic objectives as defined by the instructor” (University Policy, FPU-5.0010AP).
- A+ Attendance will be used to track attendance. Falsifying attendance for yourself or for another student is an act of academic dishonesty and is considered a violation of the university’s academic integrity policy.
- Students should not come to class if they are feeling ill, particularly if experiencing symptoms of COVID-19, or if you have been directed by a health professional to quarantine. Students who are experiencing an emergency situation that aligns with an academic exercise of consequence (e.g., /a Common Exam) should work with CARE Services at care@floridapoly.edu.
- If you must miss class for a justifiable reason, then please make sure that the absence is excused in a timely manner.
- You will receive a ½% percent deduction from your final grade for each unexcused absence, after the first 2, or for any failures to respond in class, up to the 5% total allocated to attendance.

Homework and Reading Assignments

There are two types of assignments that need to be completed on Canvas throughout the semester.

- The reading assignments are intended to provide some quick checks of terminology and simple use of equations both of which are included in the chapter summary at the end of each chapter. These assignments consist of eight multiple choice questions per chapter and each entire assignment can be reattempted once.
- The homework assignments consist of more challenging problems for which you need to solve them on canvas and to upload a clear and concise solution for all of them.
- Your grade in both categories will be calculated with one assignment of each type dropped. This rule does not apply to unattempt assignments.

In Class Quizzes

- There will be quizzes covering the major physical concepts (e.g., linear motion, vectors, force, energy, momentum, rotation, equilibrium, and oscillations) discussed this semester. These quizzes will be taken in class.
- The date of the individual quizzes will be announced in class and on Canvas at least one lecture before the quiz is given. Each student is responsible to follow up with their instructor in the event of an absence.
- The lowest quiz grade will be dropped.

Exams

There will be three common exams, and a comprehensive final. Each exam will have fifteen or so total questions, some will be multiple choice, and others may require work to be shown.

- Common exam dates listed in the schedule are tentative and will be finalized early in the semester by the Registrar’s office. The dates/times will be posted to our Canvas course site once available. Exam dates are subject to change, and you should refer to the [Academic Calendar](#) website for the most up-to-date exam schedules. Exam dates will also be announced in class at least one week prior to the scheduled event.
- A list of good, odd problems (which the back of the book has answers for) has been included on the next page of this document. Also, a practice exam will be available before each exam so you can see the exam format and further test yourself before taking it.
- You must bring a calculator for every exam.
- Make-up exams will be given only in extreme circumstances with a documented excuse. If you miss an exam because you are sick or participating in a college-sponsored activity, inform your instructor before the exam and provide them with documentation.
- The final exam grade may replace the lowest exam grade if it benefits the overall grade in the course. Note: All exams are required. The final will not replace a 0 from a missed exam.

Solutions to Free Response Problems

You will see a demonstration of algebraic manipulation of equations during the lectures. For the free response homework and exam problems, include an algebraic solution before the quantities and units are placed in. The following is a checklist for what is looked for in a complete and correct solution:

- the correct initial equations/justifications/diagrams are used,
- the mathematical steps are correct, and an algebraic solution is determined,
- all units and scientific notation are properly substituted, and
- the numeric solution is boxed with the correct units.

Late Work

- Contact your instructor if you need an extension of a homework or reading assignment for a justifiable reason.
- Late homework or reading assignments that have not been excused will not receive credit.

Grading Scale

Below is the grading scale that will be used in the course. (See also [University Grading Policy](#)).

Grade	A	A-	B+	B	B-	C+	C	C-	D	F
Percentage	≥ 93	92-90	89-87	86-83	82-80	79-77	76-73	72-70	69-60	< 60
GPA	4.0	3.67	3.33	3.0	2.67	2.33	2.0	1.67	1.0	0.0

Official Email Address

Florida Polytechnic University email is the official method of communication for the University. Students are required to check their email frequently (at least once per day). We cannot reply to any email received from an address other than those that end in floridapoly.edu.

Additional Textbook Information

Below is a list of the chapters covered, the sections and corresponding topics that will be omitted (**both what is worth reading in blue and what isn't worth reading in red**), and a list of good additional practice problems which have answers provided at the end of our textbook.

Chapter	Omit	Topics omitted	Recommended Odd Problems
1			7,9,33,39,49,51,63,67,77
2			13,21,37,47,53,57
3			7,21,27,39,41,47,61,75,113
4	4.5	Relative Motion	9,21,27,35,49,87
5			11,17,35,39,41,67,71,81
6	6.4	Drag Force and Terminal Speed	9,13,37,43,45,125
7			1,35,47,59,69,99
8	8.5	Sources of Energy	7,21,29,43,47,61,83
9	9.5, 9.7	Collisions in Multiple Dimensions, Rocket Propulsion	1,3,5,17,21,37,41,47,63,83
10	10.5, 10.8	Calculating Moments of Inertia, Rotational Work and Power	1,37,47,53,55,71,107
11	11.4	Precession of a Gyroscope	3,19,29,31,49,53
12	12.3, 12.4	Stress, Strain, and Elastic Modulus; Elasticity and Plasticity	7,27,31,39,57,67
13	13.5, 13.6, 13.7	Kepler's Laws of Planetary Motion, Tides, Theory of Gravity	5,9,13,21,25,37,43
14	14.7	Viscosity and Turbulence	9,17,27,33,49,65
15	15.5, 15.6	Damped Oscillations, Forced Oscillations	1,7,27,35,45,49

University Policies

Reasonable Accommodations

The University is committed to ensuring equal access to all educational opportunities. The Office of Disability Services (ODS), facilitates reasonable accommodations for students with disabilities and documented eligibility. It is the student's responsibility to self-identify as a student with disabilities and register with ODS to request accommodations. If you have already registered with ODS, please ensure that you have requested an accommodation letter for this course through the [ODS student portal](#), and communicate with your instructor about your approved accommodations as soon as possible. Arrangements for testing accommodations must be made in advance. Accommodations are not retroactive. If you are not registered with ODS but believe you have a temporary health condition or permanent disability requiring an accommodation, please contact ODS as soon as possible: DisabilityServices@floridapoly.edu; (863) 874-8770; www.floridapoly.edu/disability.

Accommodations for Religious Observances, Practices and Beliefs

The University will reasonably accommodate the religious observances, practices, and beliefs of individuals in regard to admissions, class attendance, and the scheduling of examinations and work assignments. (See [University Policy](#).)

Title IX

Florida Polytechnic University is committed to ensuring a safe, productive learning environment on our campus that prohibits sex discrimination and sexual misconduct, including sexual harassment, sexual assault, dating violence, domestic violence and stalking. Resources are available if you or someone you know needs assistance. Any faculty or staff member you speak to is required to report the incident to the Title IX Coordinator. Please know, however, that your information will be kept private to the greatest extent possible. You will not be required to share your experience. If you want to speak to someone who is permitted to keep your disclosure confidential, please seek assistance from the Florida Polytechnic University [Ombuds Office](#), BayCare's Student Assistance Program, 1-800-878-5470 and locally within the community at [Peace River Center](#), 863-413-2707 (24-hour hotline) or 863-413-2708 to schedule an appointment. The Title IX Coordinator is available for any questions to discuss resources and options available.

Academic Integrity

Violations of [academic integrity regulation](#) include actions such as cheating, plagiarism, use of unauthorized resources (including but not limited to use of Artificial Intelligence tools), illegal use of intellectual property, and inappropriately aiding other students. Such actions undermine the central mission of the university and negatively impact the value of your Florida Poly degree. Suspected violations will be fully investigated, possibly resulting in sanctions up to and including expulsion from the university.

Recording Lectures

Students may, without prior notice, record video or audio of a class lecture for a class in which the student is enrolled for their own personal educational use. Recordings may not be used as a substitute for class participation or class attendance. Recordings may not be published or shared in any way, either intentionally or accidentally, without the written consent of the faculty member. Failure to adhere to these requirements is a violation of state law (subject to civil penalty) and the student code of conduct (subject to disciplinary action). *Recording class activities including, but not limited to, lab sessions, student presentations (whether individually or part of a group), class discussion (except when incidental to and incorporated within a class lecture), and invited guest speakers is prohibited.*

Academic Support Resources

- **Library:** Students can access the Florida Polytechnic University Library through the University website and [Canvas](#), on and off campus. Students may direct questions to library@floridapoly.edu.
- **Tutoring and Learning Center:** The Tutoring and Learning Center (The TLC) provides tutoring to all Florida Poly students who may need additional academic support. The TLC is staffed by students who have excelled in the courses they tutor. They offer support by reviewing concepts and materials from class, clarifying points of confusion and providing assistance with learning strategies. While the focus of TLC is to provide support to students in freshman-level courses, upper-level courses are also tutored at the Center. The TLC is located in the IST Commons (second floor).
- **Knack Tutoring:** Students looking for additional assistance outside of the classroom are advised to consider working with a peer tutor through Knack. Florida Polytechnic University has partnered with Knack to provide students with access to verified peer tutors who have previously aced this course. To view available tutors, visit floridapoly.joinknack.com and sign in with your student account.

- **Academic Success Coaches:** All students at Florida Poly are assigned an Academic Success Coach. Your Academic Success Coach can assist you with academic success strategies. Please visit the Student Success Center on the second floor of the IST building to meet with an Academic Success Coach.
- **Writing Center:** Located on the second floor of the IST (2059/2061), the Writing Center helps students to develop their writing and presentation skills. Consultations are available in person and virtually. For more detail, visit floridapoly.edu/writing-center.