

SYLLABUS

PHY 2048 – Physics 1 with Calculus

Natural Sciences
Spring 2025

This syllabus contains the basic outline of the course organization. For complete details on the course policies, please visit the course Canvas page.

Sections: 24619, 14127, 23788, 23789, 23790, 17185, 17184, 14128, 14129, 14131, 14132, 14133, 14130, 14151, 14152, 14153, 14154, 14155, 14156, 14157, 14171, 14172, 21360, 18263, 21359, 14173, 14174, 18264, 14188, 18299, 18300, 18301, 21430, 21429

Attention

We recommend waiting until after the first class before you purchase any course materials. The textbook/homework system package is available via the UF All Access program. Due to the large number of students that we teach, we have been able to negotiate a greatly reduced price. Also, the university has paid for a license for iClicker, which we will be using for in-class responses. The rules for purchasing the textbook, registering for the homework system, and installing and registering your iClicker remote will be explained during the first lecture. There will also be step by step instructions on the Canvas web site.

There are no discussion section meetings Monday, January 13 – Friday, January 17th. Please make sure to come to your assigned lecture in NPB 1001 during this time to get vital information about the course and to get started learning physics.

General Education Classification

- **State Core: Natural Sciences**
- **UF: Physical Sciences (P)**
 - You may read more about the P general education designation in the [UF General Education Subject Area Objectives](#).
 - Note that a minimum grade of “C” is required for general education credit.

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.

Course Goals

Physics with Calculus 1 is a foundational course in the sense that the material introduced here will be used in many of your later science and engineering courses. Thus, it is important that you not just become familiar with the material but master the material so you can succeed in future courses and in your career. We will work together to help you gain this mastery by discussing the basic principles of physics and by practicing applying them through physics problem-solving activities.

Course Student Learning Outcomes (SLOs)

- Students will solve analytical problems describing different types of motion, including translational, rotational, and simple harmonic motion.
- Students will apply Newton's laws, and conservation laws to solve analytical problems of mechanics.
- Students will identify and analyze relevant information presented in various formats such as graphs, tables, diagrams and/or mathematical formulations.
- Students will solve real-world problems using critical thinking skills and knowledge developed from this course.

Therefore, by the end of this course, you will be able to

- Describe *why* motion happens.
- Discuss *how* motion happens.
- Determine the appropriate physical principles to apply in understanding a given mechanical situation.
- Use algebra and calculus to solve problems about the workings of the physical world.

The SLOs will be assessed through in-class participation, weekly problem sets, weekly quizzes, two midterms, and a final exam. Specifically, at the end of this course, students will be expected to have achieved the [General Education learning outcomes](#) as follows:

Content: *Students demonstrate competence in the terminology, concepts, theories and methodologies used within the discipline(s).*

- **Identify, describe, and explain** the physics of mechanics, including the mathematical description of kinematics, Newton's laws, the work-energy theorem, conservation of energy, momentum and angular momentum, Newton's law of gravitation, Archimedes principle, and the superposition principle. **(P). Assessments:** Homework problems, quizzes, and exams.
- **Identify, describe, and explain** how the scientific theories apply to real world situations and can be tested. **(P). Assessments:** questions relating to experimental demonstrations on in-class activities and exams.

Critical Thinking: *Students carefully and logically analyze information from multiple perspectives and develop reasoned solutions to problems within the discipline(s).*

- **Critically analyze, evaluate, and synthesize** information in a problem using physics knowledge to develop a solution strategy and eventually a solution to the problem. **(P). Assessments:** Homework, quizzes, exams.

Communication: *Students communicate knowledge, ideas and reasoning clearly and effectively in written and oral forms appropriate to the discipline(s).*

- **Develop and present** in writing quantitative and qualitative arguments for physics problem solutions using step by step logical reasoning. **(P). Assessments:** Hand graded quizzes.

Prerequisites

- Calculus 1 (MAC 2311)
- High school physics, PHY2020, or equivalent.

Course information

Instructors: Profs. R. Woodard (NPB2065), J. Yelton (NPB2031), and S. Weatherford (NPB2142)

Contact information: Please send e-mail only to phy2048@phys.ufl.edu. This is designed so that we can keep track of your questions and so that we can treat all students the same. If you send an e-mail to one of us individually, we will just forward it phy2048@phys.ufl.edu, possibly delaying the response. You must send messages from the UFL e-mail server. E-mails sent from gmail, yahoo, etc. or via Canvas will be ignored. E-mail is not the best way to get answers to physics questions. Please use class and office hours to seek help on specific physics and homework questions.

Teaching assistants: A complete list of teaching assistants, their contact information, and their office rooms will be on Canvas.

Meeting times: You attend Lectures on M, W, F and have one discussion period per week. Consult One.UF to find your specific lecture time and your one discussion section. You must go to your assigned room at the assigned time to get credit for iClicker in class responses and quizzes.

Office hours: A complete list of office hours for both the instructors and the teaching assistants will be posted on Canvas. You can go to the office hours of any instructor or teaching assistant. Since each TA and instructor has two office hours per week, you should be able to find multiple times that work with your schedule.

Required material:

- **Textbook:** *Fundamentals of Physics Volume 1 for UF*, by Halliday, Resnick, Walker (Wiley 12th edition). This is available through the UF All Access program. *The electronic version includes the HW access code.* The homework in this course is done online using the WileyPlus system that requires a WileyPlus access code. Details on how to purchase access to Wiley, at the special UF price, can be found on the course Canvas page.
- **iClicker:** We will be using the iClicker software for in-class response to questions. UF has purchased a license for this software so there is no additional cost to you. Again, details on the process for installing the software and registering will be given during the first class and posted to Canvas.

Materials and Supplies Fee: N/A

Weekly Schedule

Week 1

- Mon. 1/13 - Course Intro, Syllabus Review
- Wed. 1/15 - Measurement, Units, Conversion (1.1-1.3 pp1-8)
- Fri. 1/17 - 1D position, speed, velocity (2.1-2.2 pp 20-32)
- Sat. 1/18 - Practice Homework 0 due 10pm

Week 2

- Practice Quiz 0 on HW 0
- Mon. 1/20 - MLK Day
- Wed. 1/22 - 1D acceleration (2.3-2.6 pp 20-32)
- Fri. 1/24 - Vectors (3.1-3.3 pp 44-58)
- Sat. 1/25 - Homework 1 due 10pm

Week 3

- Quiz 1 on HW 1
- Mon. 1/27 - 2D motion (4.1-4.3 pp 67-75)
- Wed. 1/29 - Projectile motion (4.4-4.4 pp75-82)
- Fri. 1/31 - Circular motion, relative motion (4.5-4.7 pp82-88)
- Sat. 2/1 - Homework 2 due 10pm

Week 4

- Quiz 2 on HW 2
- Mon. 2/3 - Newton's laws, particular forces (5.1-5.2 pp101-113)
- Wed. 2/5 - Applying Newton's laws (5.3 pp113-121)
- Fri. 2/7 - Friction (6.1 pp132-138)
- Sat. 2/8 - Homework 3 due 10pm

Week 5

- Quiz 3 on HW 3
- Mon. 2/10 - Drag and terminal speed (6.2 pp138-140)
- Wed. 2/12 - Uniform circular motion (6.3 pp140-145)
- Fri. 2/14 - KE and work (7.1-7.2 pp156-163)
- Sat. 2/15 - Homework 4 due 10pm

Week 6

- Quiz 4 on HW 4
- Mon. 2/17 - Conservative forces (7.3-7.4 pp163-170)
- Wed. 2/19 - Conservative force, power (7.5-7.6 pp170-176)
- Fri. 2/21 - Review for Exam 1
- Sat. 2/12 - Homework 5 due 10pm

Week 7

- Quiz 5 on HW 5
- Mon. 2/24 - Potential energy (8.1 pp186-193)
- **Exam 1 in the evening (exact date TBD)**
- Wed. 2/26 - Conservation mech. energy (8.2 pp193-196)
- Fri. 2/28 - Energy problems (8.3-8.5 pp196-209)
- Sat. 3/1 - Homework 6 due 10pm

Week 8

- Quiz 6 on HW 6
- Mon. 3/3 - Center of mass (9.1-9.2 pp225-234)
- Wed. 3/5 - Momentum (9.3-9.5 pp235-243)
- Fri. 3/7 - Collisions (9.6-9.8 pp243-254)
- Sat. 3/8 - Homework 7 due 10pm

Week 9

- Quiz 7 on HW 7
- Mon. 3/10 - Rotation description (10.1-10.3 pp270-285)
- Wed. 3/12 - KE and moment of inertia (10.4-10.5 pp285-291)
- Fri. 3/14 - Torque equation, work (10.6-10.8 pp291-299)
- Sat. 3/15 - Homework 8 due 10pm

Week 10

- Quiz 8 on HW 8
- Mon. 3/17 - Rolling (11.1-11.2 pp310-316)
- Wed. 3/19 - Yo-Yo, angular momentum (11.3-11.6 pp316-325)
- Fri. 3/21 - Conservation L, gyroscope (11.7-11.9 pp325-333)
- Sat. 3/22 - Homework 9 due 10pm

Week 11

- Quiz 9 on HW 9
- Mon. 3/24 - Statics (12.1-12.2 pp344-355)
- Wed. 3/26 - Elasticity (12.3 pp355-360)
- Fri. 3/28 - Gravitational force (13.1-13.3 pp372-381)
- Sat. 3/29 - Homework 10 due 10pm

Week 12

- Quiz 10 on HW 10
- Mon. 3/31 - Gravitational potential energy (13.4-13.5 pp381-387)
- Wed. 4/2 - Planetary motion (13.6-13.7 pp387-390)
- Fri. 4/4 - Review for Exam 2
- Sat. 4/5 - Homework 11 due 10pm

Week 13

- Quiz 11 on HW 11
- Mon. 4/7 - Fluids (14.1-14.4 pp406-415)
- **Exam 2 in the evening (exact date TBD)**
- Wed. 4/9 - Archimedes' principle (14.5-14.7 pp415-426)
- Fri. 4/11 - Harmonic motion (15.1-15.3 pp436-466)
- Sat. 4/12 - Homework 12 due 10pm

Week 14

- Quiz 12 on HW 12
- Mon. 4/14 - SHO damped, driven, examples (15.4-15.6 pp466-457)
- Wed. 4/16 - Waves (16.1-16.3 pp468-495)
- Fri. 4/18 - Interference, standing waves (16.4-16.7 pp468-495)
- Sat. 4/19 - Homework 13 due 10pm

Week 15

- Mon. 4/21- Sound (17.1-17.8 pp505-530)
- Wed. 4/23 - Sound (17.1-17.8 pp505-530)

Final exam

- Tues. 4/29 7:30AM-9:30AM - Final Examuf

Lectures: Each lecture covers a specific set of sections in the textbook and will include problems worked out in detail.

iClicker: After the drop/add period is over, every lecture will have one iClicker question that counts towards the iClicker bonus points. There may be more than one iClicker question asked, but only one will count toward the bonus points so that each lecture is worth the same number of points. You will get one point for attempting the problem, and two points for getting it correct. In order to receive credit, you must do the iClicker questions in the lecture that you are assigned to attend. Your final iClicker will be divided by 0.8 to allow for missing a class due to an absence or just missing a problem. This is equivalent to missing about 3 weeks of lectures. There is no mechanism to give makeups for the iClicker bonus points.

Homework: Weekly homework assignments of 10 problems are due on Saturdays at 10pm EDT online via the Wiley Plus system. You will get five attempts for each problem and are allowed to seek help from the course teachers, TAs or other students in doing the problems. As indicated earlier understanding how to do the homework is the key to doing well in this course. There are no extensions or makeups for the homework due to technical issues such as losing your internet connection or forgetting to submit on time. Thus, do not wait until the last minute.

Quizzes: Most weeks there will be a quiz relating to the material covered in the previous week's homework assignment. The quizzes are given in discussion sections and typically last 20 minutes. Like the exams, the quizzes are closed book/notes, and no internet connected devices are allowed. Formula sheets are included as part of the quiz. We will divide your final quiz percentage by 0.9. This allows for some forgiveness such as doing particularly poorly during one quiz or missing a quiz due to an unexcused absence. The maximum percentage you can receive for quizzes is 100% or 20 points after dividing by 0.9.

Exams: Exams are multiple choice with randomized questions and answers. They are closed book and notes. Formula sheets are included as part of the exam. You are allowed to use a calculator so long as it cannot store images or connect to the internet. No internet connected devices are allowed at the exam. Thus, smart watches and cell phones must be put away.

- Exam 1 TBA, periods E2 and E3 (8:20pm-10:10pm) – Chapters 1-7
- Exam 2 TBA, periods E2 and E3 (8:20pm-10:10pm) – Chapters 8-13
- Final Exam: TBA - Final Exam, Time: TBA (cumulative)

Grades

Your grade is determined by the following different kinds of assignments.

Assignment/Category	Points
Exam 1	25
Exam 2	25
Final Exam	25
Homework	5
Quizzes	20
Total	100
iClicker questions (extra credit)	5

Letter grades are determined from your point score using the following table.

Grade	Range
A	100 to 85 points
A-	< 85 to 80 points
B+	< 80 to 75 points
B	< 75 to 70 points
B-	< 70 to 65 points
C+	< 65 to 60 points
C	< 60 to 55 points
C-	< 55 to 50 points
D+	< 50 to 45 points
D	< 45 to 40 points
D-	< 40 to 35 points
E	< 35 points

For information on how UF assigns grade points, visit <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>.

Attendance and Missed Work

Attendance of lectures and discussion sections is required and counts from the first class meeting. Acceptable reasons for absence include: illness, serious family emergencies, special curricular requirements (e.g. judging trips, field trips, professional conferences), military obligation, severe weather conditions, religious holidays, court-imposed legal obligations, and participation in official university activities such as music performances, athletic competition or debate. Excused absences must be documented. Please use [Contact My Instructor \(Links to an external site.\)](#) for providing documentation. The documentation for foreseeable absences like official university activities should be submitted ahead of time.

Absences due to circumstances listed above during scheduled quizzes or exams will necessitate you to request a makeup quiz or makeup exam. Makeups are to be taken within one week of returning to class. Failure to do so will result in a zero for the assignment. Unexcused absences are not entitled to makeup assessments. Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>.

Disability Services

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center by visiting <https://disability.ufl.edu/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Requesting an accommodation letter to be sent to instructors via the course email address, phy2048@phys.ufl.edu, is sufficient for receiving accommodations, as long as the letter is received **at least five working days** prior to the deadline for assessments. Letters received less than five working days before the assignment deadline will have the accommodations applied for the next and subsequent assessments.

Exams: Students requesting accommodations on exams must complete the testing center ATR prior to the four-business day deadline, as described on the DRC website. The start time for the assembly exams will be based on your accommodation for extended time according to the table below.

Accommodation	Assembly Exam Start Time
1.5x	6:45pm
2.0x	5:45pm
2.5x	4:45pm

Discussion Section Quizzes: Students with less than 1.5x extended time may elect to take the quiz at the nominally scheduled time in discussion sections, inquire with your TA about these arrangements if it works for you. Alternatively, complete an ATR for a proctored quiz at the DRC. Students with accommodations of 2.0x or greater must complete an ATR for each quiz and submit before the testing center deadline (five working days). All ATRs for testing center quizzes must be scheduled on the same day as the student's discussion section meeting. The time of the appointment is your choice and may occur either before or after your discussion section meeting.

Accommodations are not retroactive. Therefore, students should contact the DRC office as soon as possible in the term for which they are seeking accommodations. Failure to send a current test accommodation request (ATR) before the 5 working day deadline is not a permitted excuse for taking a makeup exam.

How To Do Well In This Class

If you want to learn a particular sport, like basketball for example, you have to practice and play the game. You can't just watch others play the game, although you can learn things from watching other people play.

The same is true of physics. You can learn something by watching the instructors do problems, but ultimately you have to practice yourself. In this course the homework is where you practice. Your goal should not be to just get the right answers, but to learn and ultimately master how to do the problems.

Tip #1: Try to do the homework yourself first. If you get stuck, review your notes, the lecture recording, and the textbook. If you are still stuck, consult with an instructor or TA or one of your friends in the class. There is no point in staying spinning your wheels and making no progress.

Tip #2: After you get the right answer, go back and make sure you understand how and why you got the answer.

The homework is submitted numerically on-line with multiple attempts allowed. There is a tendency to just try stuff because you get multiple attempts. Also, the first time you do a problem, you may not do it in the most direct manner. A right answer does not necessarily mean mastery of the material.

The material in this course is cumulative, meaning that the material in week 1 is used in week 2, and the material in week 10 uses the material in weeks 1-9. Hence, you need to learn one topic before you can do the next one.

Tip #3: Stay current in the course.

It will be more efficient to do a little homework after each lecture than to wait until Saturday to even look at the homework. Everyone is busy with lots of deadlines, but by doing a little work several times a week, you will actually spend less time overall on the homework because you are mastering the material as we go along.

Tip #4: Memorize or learn the process not the problem.

You will do over 100 homework problems, and we will give you around 1000 practice exam problems to do if you want to. Nonetheless, the exam questions for this semester will not be identical to any of these problems. However, the thought process to do the problems in the exam will be identical to those used in the homework and the old exams.

This course is about problem solving, which means taking different pieces of information, in our case physical laws and equations, and putting them together to solve problems. Practicing scientists, engineers and medical doctors are valued for their ability to solve problems – not to look up information, which can be done with a computer search. Throughout the course we will emphasize problem solving.

Academic Honesty Policy and Honor Code

We go to great lengths to ensure that our Physics course is administered fairly, by setting clear goals (what is needed to attain each grade) at the outset, by providing materials (lectures, applets, homework, office hours, reviews) to help you reach those goals, and by assessing progress towards those goals using easily understood procedures (exams, quizzes, online homework). We pledge to do the best job we can to make the material understandable and to bring out the best in every student.

Course Policy

Maintaining the integrity of the grading process demands fairness and compassion on our part and honor on your part. Accordingly, we take a very hard line on cheating in any form, including

1. Providing or copying answers on exams or quizzes
2. Taking an exam or quiz for another student
3. Entering online homework answers for another student
4. Distributing or copying exam or quiz questions
5. Obtaining course homework solutions or software algorithms from external sources, including websites or companies that give away or sell such solutions or algorithms.

Honor Code

UF students are bound by The Honor Pledge which states “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Conduct Code specifies a number of behaviors that are in violation of this code and the possible sanctions. [See the UF Conduct Code website for more information.](#) If you have any questions or concerns, please consult with the instructor or TAs in this class.

Online Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at gatorevals.aa.ufl.edu/students/ (Links to an external site.). Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via ufl.bluera.com/ufl/ (Links to an external site.). Summaries of course evaluation results are available to students at gatorevals.aa.ufl.edu/public-results/.

Campus Resources and Student Success

Health and Wellness

- *U Matter, We Care*: If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 or visit [U Matter,We Care](#) website to refer or report a concern and a team member will reach out to the student in distress.
- [Counseling and Wellness Center](#): 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.
- Student Health Care Center, 392-1161. Call 352-392-1161 for 24/7 information to help you find the care you need, or [visit the Student Health Care Center website](#).
- [University Police Department](#), [Visit UF Police Department website](#) or call 392-1111 (or 9-1-1 for emergencies).
- GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the [GatorWell website](#) or call 352-273-4450

Academic Resources

- [E-learning technical support](#), 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.
- [Career Connections Center](#), Reitz Union, 392-1601. Career assistance and counseling.
- [Library Support](#), various ways to receive assistance with respect to using the libraries or finding resources. Call 866-281-6309 or email ask@ufl.libanswers.com for more information.
- [Teaching Center](#), 1317 Turlington Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.
- [Writing Studio](#), Daytime (9:30am-3:30pm): 2215 Turlington Hall, 352-846-1138 | Evening (5:00pm-7:00pm): 1545 W University Avenue (Library West, Rm. 339). Help brainstorming, formatting, and writing papers
- Academic Complaints: Office of the Ombuds; [Visit the Complaint Portal webpage for more information](#)
- Enrollment Management Complaints (Registrar, Financial Aid, Admissions): [View the Student Complaint Procedure webpage for more information](#).