PHY2048 - Physics 1 with Calculus, SUMMER 2025

Class # 14286, 14287, 14288, 14289, 14290, 14291

Welcome

Physics, like all human endeavors, is something that is learned. Physics is practiced and advanced by a scientific community of individuals with diverse backgrounds and identities and is open and welcoming to everyone. We recognize the value of individuals in all aspects of this course as defined by the UF non-discrimination policy, and includes, but is not limited to differences in race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information and veteran status (1.006).

Our aim is to foster an atmosphere of learning that is based on inclusion, transparency, and respect for all. We acknowledge the different needs and perspectives we bring to our common learning space and strive to provide everyone with equal access. We hope you truly believe, as we do, that by meeting the prerequisites, you belong in this physics class and are well-positioned for success.

Please don't hesitate to contact us with any concerns you may have as you embark on your physics journey.

Contact Information

- **Course Email: phy2048@phys.ufl.edu**
  - **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. 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.
- **Instructors**
  - TBD
    - Office:
    - Phone:
    - Office Hours:
- **TAs**
  - TBD
    - Office:
    - Office Hours:
    - Phone:
    -

Course details

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 Aim

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 Goal

Broadly speaking, this course provides instruction on how to apply quantitative models to the dynamics of systems to make predictions about the quantities which describe its motion through space and time, using calculus when needed. Students will learn to apply the correct models based on their evaluation of how systems interact with their surroundings and make decisions on how to proceed with the analysis according to the selection of appropriate fundamental physics principles. Additionally, students will be able to explain physical phenomena using qualitative methods, including use of deductive reasoning. Finally, we will show through live demonstrations how to apply these models to real world systems.

Course Student Learning Outcomes (SLOs)

Student learning outcomes:

- students will solve analytical problems describing different types of motion, including translational, rotational, and simple harmonic motion. (SLO1)
- students will apply newton's laws, and conservation laws to solve analytical problems of mechanics. (SLO2)
- students will identify and analyze relevant information presented in various formats such as graphs, tables, diagrams and/or mathematical formulations. (SLO3)
- students will solve real-world problems using critical thinking skills and knowledge developed from this course. (SLO4)

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 basic concepts, theories, discoveries, processes, and terminology of physics and the scientific method (e.g. 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).(SLO1 and SLO2) (**P**). **Assessments:** Homework problems, quizzes, and exams.

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

- **Identify, describe, and explain** how the scientific theories apply to real world physical systems and can be tested, including applying techniques of discovery and critical thinking to evaluate outcomes of experiments. (SLO1, SLO2, and SLO4) **(P)**. **Assessments:** questions relating to experimental demonstrations on in-class activities and exams.
- **Critically analyze**, **evaluate, and synthesize** information in a problem using physics knowledge to develop a solution strategy consistent with logical reasoning skills as language of scientific criticism and producing a solution serving as an argument to the problem that is evaluated for validity using dimensional analysis or order of magnitude estimations (SLO3 and SLO4) **(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 in a clear and effective manner. (SLO1-4) **(P)**. **Assessments:** Hand graded quizzes.

Course Prerequisites

MAC 2311; High school physics, PHY2020, or equivalent.

Since high school physics classes vary widely in terms of depth and topics covered, we will be starting from scratch. For those of you that have had a good high school physics class, the first part of the course will be a review; however, be careful. We will eventually be covering material that you have probably not seen in high school. For those students who have not had as much physics, don't worry - as we said, we will be starting from scratch. You may have to work harder during the first part of the semester, but we will all end up at the same place by the end of the semester.

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.

Required Materials

- ***Fundamentals of Physics Volume 1 for UF*, by Halliday, Resnick, Walker (Wiley 12th edition)**
    - This is a combination textbook and homework system. It will be available through the UF All Access program. Details of the process will be given during the first class and will be posted to Canvas. We have negotiated a reduced price from the publisher so this will be the lowest-cost option.
- **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 will be posted to Canvas.
- **Materials and Supplies Fee: N/A**

Expectations

- **Meeting Times:**
    - Lectures meet in NPB1001 on MWF during Period 3 as well as 8 discussion sections meeting one time per week. Consult ONE.UF to find your specific lecture time and room for discussion section. You must attend the lecture that you are registered for in order to get credit for the iClicker in-class responses.
- **Homework:**
    - Weekly homework assignments of 10 problems are due on Saturdays at 10pm Eastern online via the Wiley Plus system. You will get five attempts for each problem and are allowed to seek help from the course teachers or other students in doing the problems. Note that there is a small 5% deduction per incorrect answer attempt. 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. We will drop the two lowest homework assignments due to possible technical difficulties and missing deadlines.
- **Quizzes:**
    - For most weeks there will be quizzes 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 drop the two lowest quiz scores. This allows for some forgiveness such as doing particularly poorly during one quiz or missing a quiz due to an unexcused absence. Quizzes are worth a total of 20 points
- **Exams:**

- Exams are multiple-choice with randomized questions and answers. They are closed-book and notes are not allowed. A formula sheet is 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 device is allowed at the exam. Thus, smart watches and cell phones must be put away. Exams are worth a total of 75 points.
  - **Exam 1: 6/3/2025, periods E1 and E2 (7:00pm-9:00pm) -TENTATIVE**
  - **Exam 2: 7/8/2025, periods E1 and E2 (7:00pm-9:00pm) -TENTATIVE**
  - **Final Exam: 8/4/2025, 7:00pm-9:00pm (cumulative) -TENTATIVE**

- **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. If you get the problem correct, you will receive a total of two points. In order to receive credit you must do the iClicker questions in the lecture that you are assigned to attend. Your final iClicker score will be divided by 0.8 to allow for missing a class due to an unexcused 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. There is a maximum of 100% or 5 points after dividing by 0.8.

Disability Services

- Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center. 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:**
  - The UF Testing Center will facilitate all assembly exams for students utilizing accommodations on the exam. The start times are prescribed below based on any extended time accommodations indicated in the student accommodation letter. Therefore, students requesting accommodations on exams must complete the testing center ATR prior to the four-business day deadline, as described on the DRC website if you elect to utilize your accommodations for assembly exams. Please schedule your assembly exams without delay.

Accommodated Exam Start Time

Accommodation	**Assembly Exam Start Time**
1.5x	6:00pm

Accommodated Exam Start Time

Accommodation	Assembly Exam Start Time
2.0x	5:30pm

- **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 (four 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 accommodation letter before the five-working-day deadline is not a permitted excuse for taking a makeup exam.

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 Honor Code (http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. If you have any questions or concerns, please consult with the instructor or TAs in this class."

Grade Calculation & Scheme

- **Grade Components:**
  - Your grade is determined by the different kinds of assignments listed above in the following proportions:

Grade Proportions

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

- **Letter Grades:**
  - Letter grades are determined from your point score using the following table.

Letter Grade Scheme

Grade	Range
A	> 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 50 points
D-	< 40 to 35 points

Letter Grade Scheme

Grade	Range
E	< 35 points

- Note that a minimum grade of "C" is required for general education credit. For information on how UF assigns grade points, visit UF Grading Policies.

- **Attendance and Missed Work:**
  - Attending 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 (except religious holidays). 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.
    - To request a makeup, please email your discussion section TA with documentation supporting the rationale for why you are eligible for a makeup quiz.
    - Makeup quizzes must be completed within two weeks of the missed quiz.
    - Makeup quizzes will be administered on Fridays during the hour of 6:15-7:15 pm in room NPB 1101. See the course calendar. You must show up in time to finish your quiz by 7:15 pm. Quizzes will end promptly at 7:15pm or when the allotted time expires, whichever comes first. Students with extended time accommodations will be accommodated during this weekly makeup session window.
    - The deadline for emailing your TA for consideration of the next makeup quiz administration is Wed at noon. Requests received by TAs after this deadline will be scheduled the following week if approved and if the next makeup quiz administration falls within the two week deadline of the missed quiz.
    - All makeups must be completed by Aug 1st.

Course Structure

Each lecture covers a specific set of sections in the textbook and will include problems worked out in detail. You will be asked to work out some problems during lecture and report your answer using iClicker for bonus points.

After lecture, you will be set to start the homework problems relating to the lecture and the sections covered in the book. Homework is submitted on-line and due on Saturdays at 10pm. This is your chance to learn and practice the material for yourself. Solutions to the problems are available after the due date in the homework system.

In your discussion section the following week you will take a quiz relating to the material in the homework. This is your chance to test your mastery of the material.

The order of lecture, homework, and quiz repeats every week. There are three exams, which will evaluate your mastery of the course material.

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, a TA, the UF Teaching Center, or one of your friends in the class. There is no point in staying spinning your wheels and making no progress. You can go to any of the large number of office hours that we have per week (see Disc. Sect. + Office Hours in Canvas). We can also recommend the UF Teaching Center.
- **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 online 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: Work out the problems by writing each step down.**
  - Early in the course the problems may be doable using just your calculator without writing anything down. Eventually this will not be possible. It is good to get in the habit of writing down your work. The instructors will model this in class. It is far

easier to check your work once it is written down, than to have to redo a problem to check it.

- **Tip #4: 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 #5: 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.

Schedule

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. 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 Bluera. Bluera. Summaries of course evaluation results are available to students at GatorEvals 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

Schedule

Week	Sun	Monday	Tuesday	Wednesday	Thursday	Friday
1	**5/11**	**Ch 1** Units (p.1-8)	**Drop/Add Ends**	**CH 2.1-2.4** 1D-Motion (p.13-28)		**CH 2.5-2.6** Variable Acceleration (p.28-32)
2	**5/18** **HW1**	**CH 3.1-3.3** Vectors Dot and Cross Products (p.44-58)	**Quiz 1** **(Practice)**	**CH 4.1-4.4** Average vs Instantaneous Projectile Motion (p.67-82)	**Quiz 1** **(Practice)**	**CH 4.5-4.8** Circular Motion 3D-Motion (p.82-88)

				Quiz 1 (Practice)		
3	**5/25** **HW2**	**Holiday**	**Quiz 2**	**CH 5.1-5.3** Newton's Laws (p.101-121) **Quiz 2**	**Quiz 2**	**CH 6.1-6.3** Inclined Planes Pulleys (p.132-145)
4	**6/1** **HW3**	**CH 6.1-6.3** Friction & Drag Circular Motion (p. 132-145)	**Quiz 3**	**Exam Review** **Quiz 3** **Exam 1**	**Quiz 3**	**CH 7.1-7.4** Kinetic Energy & Work (p.156-170)
5	**6/8** **HW4**	**CH 7.5-8.1** Power Potential Energy (p. 170-190)	**Quiz 4**	**CH 8.2-8.5** Conservative Forces Conservation of Energy (p.193-209) **Quiz 4**	**Quiz 4**	**CH 9.1-9.5** Center of Mass Impulse & Momentum (p.225-243)
6	**6/15** **HW5**	**CH 9.6-9.9** Collisions 1D & 2D Rockets (p.243-254)	**No Quiz**	**CH 10.1-10.4** Rotations Angular Acceleration	**Holiday** **No Quiz**	**CH 10.5-10.8** Moment of Inertia Torque Work

				Kinetic Energy (p.270-286) **No Quiz**		(p.286-299)
7	**6/22** **HW6**	SUMMER BREAK				
8	**6/29**	**CH 11.1-11.4, 11.6** Rolling Newton's 2nd Law (p.310-318)	**Quiz 6**	**CH 11.5, 11.7-11.9** Angular Momentum (p.320-334) **Quiz 6**	**Quiz 6**	**Holiday**
9	**7/6** **HW7**	**CH 12.1-12.2** Equilibrium I (p.344-355)	**No Quiz**	**Review** **No Quiz** **Exam 2** **CH. 6-11**	**No Quiz**	**CH 12.3** Equilibrium II Elasticity (p.355-360)
10	**7/13** **HW8**	**CH 13.1-13.6** Gravity I Superposition (pp.372-390)	**Quiz 7**	**CH 13.7-14.3** Gravity II Orbits & Energy Fluids (pp.390-413) **Quiz 7**	**Quiz 7**	**CH 14.4-14.7** Fluids Pascal, Archimedes, Bernoulli (p.413-426)

11	**7/20** **HW9**	**CH 15.1-15.3** Simple Harmonic Motion (p.436-448)	**Quiz 8**	**CH 15.4-15.6** Pendulums Damped SHM Resonance (p.448-457) **Quiz 8**	**Quiz 8**	**CH 16.1-16.4** Waves I Wave Equation (p.468-482)
12	**7/27** **HW10**	**CH 16.5-16.7** Interference Standing Waves (p.482-495)	**Quiz 9**	**CH 17.1-17.4** Sound Waves Intensity (p.505-518) **Quiz 9**	**Quiz 9**	**CH 17.5-17.8** Music Doppler Effect (p.518-530)
13	**8/3**	**Review**		**Final Exam** **Cumulative**		