

PHY2048 Physics with Calculus 1, Fall 2022

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.

Contact Information

- **Course Email: phy2048@phys.ufl.edu**
 - **Please send e-mail only to phy2048@phys.ufl.edu, which will be active when classes start.** 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**
 - Prof. Kathryn McGill
 - Office: NPB 2112
 - Phone: (352) 846-2548
 - Office Hours: TBA
 - Prof. Xiaoguang Zhang
 - Office: NPB 2332
 - Phone: (352) 392-6971
 - Office Hours: TBA
 - TAs TBA

Course Description

The first of a two-semester sequence of physics for scientists and engineers. The course covers Newtonian mechanics and includes motion, vectors, Newton's laws, work and conservation of energy, systems of particles, collisions, equilibrium, oscillations and waves.

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)

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.

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. 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.

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:**
 - There are three different lecture times in NPB1001 as well as 20 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. 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 divide your homework score by 0.8 to account for possible technical difficulties. The maximum percentage you can receive for the homework is 100% or 5 points after dividing by 0.8.

- **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. 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. 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.
 - Exam 1: 10/5/2022, periods E2 and E3 (8:20pm-10:10pm)
 - Exam 2: 11/8/2022, periods E2 and E3 (8:20pm-10:10pm)
 - Final Exam: 12/13/2022, 7:30am-9:30am (cumulative)
- **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.

Evaluation

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

Assignment/Category	Points
Exam 1	25
Exam 2	25
Final Exam	25
Homework	5
Quizzes	20
Total	100

iClicker (extra credit)	5
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- **Letter Grades:**

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

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 40 points
D-	< 40 to 35 points
E	< 35 points

- 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. 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](#).

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.

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 three working days** prior to the deadline for assessments. Letters received less than three 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	7:15pm
2.0x	6:15pm
2.5x	5:15pm

- **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. **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 three-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.

Any person caught cheating in any form will fail the entire course automatically and will be subject to Honor Court penalties. Furthermore, we expect students not to tolerate cheating of any kind and to report incidents to your instructors.

Honor Code

The [Dean of Students Office](#) has a detailed discussion about academic honesty and the University of Florida Honor Code, which was adopted by the Student Council. The Honor Code says

We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity. 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."

Course Schedule

Week 1

- **Discussions sections do not meet this week**
- Wed. 8/24 - Course Intro, Syllabus Review
- Fri. 8/26 - Measurement, Units, Conversion (1.1-1.3)
- [Sat. 8/27 - Practice Homework 0 \(Ch. 1\) due 10pm](#)

Week 2

- **No Quiz this week**
- Mon. 8/29 - 1D position, speed, velocity (2.1-2.2)
- Wed. 8/30 - 1D acceleration (2.3-2.6)
- Fri. 9/2 - Vectors (3.1-3.3)
- [Sat. 9/3 - Homework 1 \(Ch. 2\) due 10pm](#)

Week 3

- **Practice Quiz 0 on HW1**
- Mon. 9/5 - Labor Day Holiday
- Wed. 9/7 - 2D motion (4.1-4.3)
- Fri. 9/9 - Projectile motion (4.4)
- [Sat. 9/10 - Homework 2 \(Ch. 3, 4.1-4.3\) due 10pm](#)

Week 4

- **Quiz 1 in discussion section on HW2**
- Mon. 9/12 - Circular motion, relative motion (4.5-4.7)
- Wed. 9/14 - Newton's laws, forces (5.1-5.2)
- Fri. 9/16 - Applying Newton's laws (5.3)
- [Sat. 9/17 - Homework 3 \(Ch. 4.4-5.2\) due 10pm](#)

Week 5

- **Quiz 2 in discussion section on HW3**
- Mon. 9/19 - Friction (6.1)
- Wed. 9/21 - Drag and terminal speed (6.2)
- Fri. 9/23 - Uniform circular motion (6.3)
- [Sat. 9/24 - Homework 4 \(Ch. 5.3-6\) due 10pm](#)

Week 6

- **Quiz 3 in discussion section on HW4**
- Mon. 9/26 - Kinetic energy and work (7.1-7.2)
- Wed. 9/28 - Conservative forces (7.3-7.4)
- Fri. 9/30 - Conservative forces, power (7.5-7.6)
- [Sat. 10/1 - Homework 5 \(Ch. 7\) due 10pm](#)

Week 7

- **Quiz 4 in discussion section on HW5**
- Mon. 10/3 - Potential energy (8.1)
- Wed. 10/5 - Conservation of Mech. Energy (8.2)
- **Wed. 10/5 - Exam 1 (Ch. 1-7) periods E2 and E3**
- Fri. 10/7 - Homecoming Holiday
- [Sat. 10/8 - Homework 6 \(Ch. 8.1-8.2\) due 10pm](#)

Week 8

- **Quiz 5 in discussion section on HW6**
- Mon. 10/10 - Energy problems (8.3-8.5)
- Wed. 10/12 - Center of mass (9.1-9.2)
- Fri. 10/14 - Momentum (9.3-9.5)
- [Sat. 10/15 - Homework 7 \(Ch. 8.3-9.4\) due 10pm](#)

Week 9

- **Quiz 6 in discussion section on HW7**

- Mon. 10/17 - Collisions (9.6-9.9)
- Wed. 10/19 - Rotation (10.1-10.3)
- Fri. 10/21 - Kin. Energy, Moment of inertia (10.4-10.5)
- [Sat. 10/22 - Homework 8 \(Ch. 9.5-10.5\) due 10pm](#)

Week 10

- **Quiz 7 in discussion section on HW8**
- Mon. 10/24 - Torque equation, work (10.6-10.8)
- Wed. 10/26 - Rolling (11.1-11.2)
- Fri. 10/28 - Yo-Yo, angular momentum (11.3-11.6)
- [Sat. 10/29 - Homework 9 \(Ch. 10.6-11.6\) due 10pm](#)

Week 11

- **Quiz 8 in discussion section on HW9**
- Mon. 10/31 - Conservation L, gyroscope (11.7-11.9)
- Wed. 11/2 - Statics (12.1-12.2)
- Fri. 11/4 - Statics, Elasticity (12.3-12.3)
- [Sat. 11/5 - Homework 10 \(Ch. 11.7-12\) due 10pm](#)

Week 12

- **Quiz 9 in discussion section on HW10**
- Mon. 11/7 - Gravitational force (13.1-13.3)
- **Tues. 11/8 - Exam 2 (Ch. 8-12) periods E2 and E3**
- Wed. 11/9 - Gravitational PE (13.4-13.5)
- Fri. 11/11 - Veterans Day Holiday
- [Sat. 11/12 - Homework 11 \(Ch. 13.1-13.5\) due 10pm](#)

Week 13

- **Quiz 10 in discussion section on HW11**
- Mon. 11/14 - Planetary Motion (13.6-13.7)
- Wed. 11/16 - Fluids (14.1-14.4)
- Fri. 11/18 - Archimedes' principle (14.5-14.7)
- [Sat. 11/19 - Homework 12 \(Ch. 13.6-14\) due 10pm](#)

Week 14

- **No Quiz this week**
- Mon. 11/21 - Harmonic motion (15.1-15.3)
- Wed. 11/23 - Thanksgiving Holiday
- Fri. 11/25 - Thanksgiving Holiday
- [Sat. 11/26 - No Homework due](#)

Week 15

- **Quiz 11 in discussion section on HW12**
- Mon. 11/28 - SHO damped, driven, examples (15.4-15.6)
- Wed. 11/30 - Waves (16.1-16.7)

- Fri. 12/2 - Sound I (17.1-17.4)
- [Sat. 12/3 - Homework 14 \(Ch. 15-16\) due 10pm](#)

Week 16

- **No Quiz this week**
- Mon. 12/5 - Sound II (17.1-17.4)
- Wed. 12/7 - Sound III (17.4-17.8)

Final Exam Week

- **Tue. 12/13 - Final Exam (cumulative) 7:30am–9:30am**

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 so that a team member can reach out to the student.
- [Counseling and Wellness Center](#): 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.
- *Sexual Assault Recovery Services (SARS)* Student Health Care Center, 392-1161.
- [University Police Department](#), 392-1111 (or 9-1-1 for emergencies).
- [UF Student Success](#):
 - For improving study skills to connecting with a peer tutor, peer mentor, success coach, academic advisor, and wellness resources.

Academic Resources

- [E-learning technical support](#), 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.
- [Career Resource 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.
- [Teaching Center](#), Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.
- [Writing Studio](#), 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
- [Student Complaints](#)