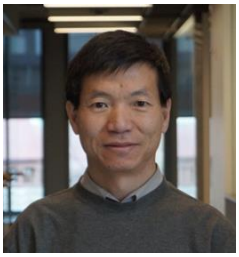
PHYS0030 “Basic Physics A” Fall 2025

Course and Instructor Information

Course Information

Course title and number	PHYS0030 “Basic Physics A” Fall 2025
Meeting times	M/W/F, Section 1: 11-11:50 am, Section 2: 12-12:50 pm
Classroom location	Barus & Holley 166
Canvas site	https://canvas.brown.edu/courses/1099747
Prerequisites	None

Instructor/Instructional Team Information

	First and last name *Role in PHYS0030*	**Office**	**Preferred contact**
	**Prof. Michelle Vick** *Instructor* Responsible for lecture contents, demonstrations, pre-class assignments, and homework assignments	Barus & Holley 345	michelle_vick@brown.edu
	**Prof. Jay Tang** *Instructor* Responsible for lecture contents, demonstrations, pre-class assignments and homework assignments	Barus & Holley 702	jay_tang@brown.edu

	**Prof. Miquel Dorca** *Course manager* Responsible for all course administration matters (workshops, exams, makeup exams, grading, Dean's notes, SAS accommodations, etc.)	Barus & Holley 347	miquel_dorca@brown.edu
	**Prof. Gregory Tucker** *Lab manager* Responsible for all lab aspects (lab TA training, section assignments, lab reports, makeup labs, etc.)	Barus & Holley 520	gregory_tucker @brown.edu
	Jesse Tessier *Administrative assistant* Responsible for homework grader coordination, exam and workshop material, record corrections, etc.	Barus & Holley 4th Floor South	jesse_tessier @brown.edu

Please include "PHYS0030" (8 characters, no spaces) in the subject line of any emails you send so that automated email alerts catch them. To avoid delays in responses, please address your questions to the appropriate instructor based on their specific responsibilities.
We will communicate office hours via Canvas.

Course Description

General Orientation to the Course & Course Goals

What rules govern mechanical oscillations and what do they have to do with your smartphone's sense of orientation? How can ultrasound waves be used to image embryos, kill cancer, or measure blood flow rates? And how are these questions related to what we know about our solar system? PHYS0030 equips you with the tools needed to answer these questions by introducing you to physics, the science that describes behavior and structure of matter on all scales, ranging from the smallest particles in nature to the properties of the universe. The goal of physics is to understand natural phenomena both conceptually and quantitatively on the basis of a small number of physical laws. PHYS0030 focuses on the quantitative description of motion, including applications to fluids and life science. It is the first part of a year-long introduction to physics (PHYS0030 & 0040) designed primarily for non-physics concentrators, including pre-medical students, who do not intend to take advanced courses in the physics curriculum.

Learning Objectives

By the end of this course, you will be able to:

LO1. Use algebra, geometry, trigonometry, and analytic geometry to predict and describe a range of phenomena at the macroscopic and microscopic scales.

LO2. Solve problems through the systematic application of mechanical principles, and appreciate the power of this approach for unraveling complex phenomena and deepening your understanding of scientific concepts.

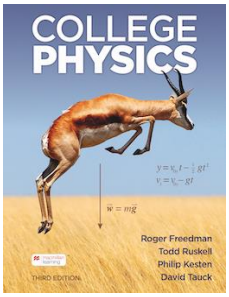
LO3. Execute and describe quantitative tests of the physics theory behind phenomena, and develop the capacity to see the phenomena at work in the world around you.

LO4. Qualitatively describe, identify, and appreciate how these physical principles control phenomena around you, have been employed in high technology instruments and apply in other scientific fields.

LO5. Employ techniques to reflect on the results of your calculations or other analyses to assess their validity.

LO6. Appreciate that there is great diversity in the motivations, world views, and approaches that influence folks as they study physics and that engaging with this diversity can enhance your learning.

Course material: Textbook and Achieve



PHYS0030 and PHYS0040 closely follow the same textbook: College Physics, Third Edition, Roger A. Freedman; Todd Ruskell; Philip R. Kesten; David L. Tauck. The courses employ Achieve, an online resource, for animations and many problem assignments. You can gain access to these resources in one of the following ways (with free trial access during shopping period).
You can get textbook and Achieve access either from the Brown Bookstore (1-term Achieve subscription with loose-leaf textbook), or from Macmillan Learning's Student Store:

Loose-leaf Version for College Physics & Achieve for College Physics (1-Term Access CARD), ISBN:9781319397760, Retail - $149.99
Loose-leaf Version for College Physics & Achieve for College Physics (2-Term Access CARD), ISBN:9781319397791, Retail - $199.99
College Physics Loose-leaf Version, ISBN:9781319354138, Retail - $214.99
Achieve for College Physics (1-Term Access CARD), ISBN:9781319337889, Retail - $99.99

The publisher allows free access to the Achieve online content over the shopping period so that students can access and complete assignments before textbook/Achieve purchase.

You must access Achieve through the Canvas course page by clicking on Macmillan Learning to register an account so that the course work performed will be recorded on Canvas.

If your Brown undergraduate financial aid package includes the Book/Course Material Support Pilot Program (BCMS), concerns or questions about the cost of books and course materials for this or any other Brown course (including RISD courses via cross-registration) can be addressed to bcms@brown.edu. For all other concerns related to non-tuition course-related expenses, whether or not your Brown undergraduate financial aid package includes BCMS, please visit the Academic Emergency Fund in E-GAP (within the umbrella of "E-Gap Funds" in UFunds) to determine options for financing these costs, while ensuring your privacy.

Learning Activities, Assessments, and Time Allocation

Assessment of learning and course grading

Assignment	Percent of grade	Due date	Notes
Pre-class assignments	10	9 am the day of class	5 lowest scores dropped
Workshop participation	8	Assigned lab section time	Lowest score dropped
Online Homework	11	Thursdays at 23:59 pm ET	2 lowest scores dropped
Written Homework	11	Thursdays at 23:59 pm ET	2 lowest scores dropped
Exam 1	15	October 9	
Exam 2	20	November 6	
Exam 3	25	TBA	
Labs	n/a		earn ≧ 75/100 in each of all 4 labs to pass course

Letter grade: Your letter grade will be determined by a weighted average of your assignment scores with the weights shown in the table. Achieving a score of 90% or above will ensure an “A” grade for the course. A total score of 80% or above will ensure a "B" grade. A total score of 60% or

above will ensure a "C" or “PASS”.

Learning Activities, Assignment Descriptions, and Assessment

(* affects course grade)

The primary course resources and activities are described below. These activities collectively provide the means for developing problem-solving skills and quantitative techniques for describing physical phenomena. An asterisk (*) denotes activities, which include assignments that are factored into the course grade.

Class Meetings: Class meetings focus on developing a conceptual understanding of the material as well as problem-solving, using a variety of active learning methods. We strongly encourage you to read the relevant chapter in the textbook as indicated on the course calendar prior to each class meeting, as we will discuss the chapter content in class meetings at the hand of specific examples. Demonstrations of relevant physics phenomena will also be shown and discussed. Class Meetings are on Mondays, Wednesdays, and Fridays from 11:00 AM - 11:50 AM and 12:00 PM - 12:50 PM in Barus & Holley 166. Lectures will be recorded and made available on Canvas (under the *Media Library* tab) after the class.

Pre-Class Assignments* (LO1, LO2, LO5): To help you prepare for each class meeting, there is a pre-lecture assignment on Achieve that aligns with the textbook reading relevant to the class topic. It consists of animations and quiz questions that give you the chance to develop some familiarity with but not command over the material. The questions focus on the central concepts and helpful examples introduced in the assigned reading and animations. While there are no point deductions for video assignments, there is a 20 % deduction per additional attempt in answering quiz-type questions. We encourage you to discuss homework assignments with others but you must submit your own work (see notes on the Academic Code below). We will pay attention to how you do on these quizzes so that we can adjust what we do in class to meet your learning needs. For this reason, we require pre-class assignments to be submitted by 9 am the day of class with no exceptions. However, to offer flexibility we drop the lowest 5 scores of your pre-class assignments.

Workshop Participation* (LO1, LO2, LO4, LO5, LO6): The primary goal of the workshop is to foster the development of problem-solving skills while, at the same time, gaining familiarization with the concepts covered in the lecture. Workshops are team-work assignments, as you will work with your peers in small collaborative groups on mostly conceptual physics questions to promote discussion and to provide practice on the concepts and problem-solving strategies. A teaching assistant will be available to encourage and facilitate discussions and answer questions. There are 5 mandatory workshops throughout the semester in which you earn credit as follows: full attendance and participation results in 2 points; this can be reduced to 1 or 0 points in case of missing a large portion of the workshop, lack of participation, or other behavioral issues.

Due to logistic constraints, we ask you to attend the workshop section in the same 80 minute time

slot as your lab section (labs and workshops take place in different weeks). Attending a different workshop section within a week is possible in exceptional cases such as sickness or other serious issues with permission the course manager (Prof. Dorca) may grant upon timely notice. To accommodate your inability to attend a mandatory workshop for any reason, we calculate your total workshop score after dropping the lowest 1 out of 5 workshop scores.

Homework* (LO1, LO2, LO4, LO5)
Homework assignments consist of conceptual questions, estimations, multiple-choice questions, and worked-out calculations and will be assigned nearly weekly. These assignments provide you the opportunity to express physics concepts and their applications in your own words, to practice applying principles to quantitatively describe physical phenomena, and to develop your quantitative problem-solving techniques. We encourage you to discuss homework assignments with others but you must submit your own work (see notes on the Academic Code below). Homework consist of two parts:

> **Part 1: Online Homework***: These Achieve-based assignments consist of multiple-choice questions, conceptual exercises, and quantitative fill-in-the-blank problems. You are welcome to explore hints to problems provided on Achieve to guide your solution. You will have the opportunity to attempt each problem multiple times, with a 20% deduction per attempt. Achieve will automatically score your solution and provide feedback.
>
> **Part 2: Written Homework***: Written homework assignments are posted on Canvas and are typically quantitative problems that require a written response following the *Setup, Solve, Reflect* approach demonstrated in the textbook (section 1-2). You will scan your written answers and upload them as an easy to read PDF on Canvas. Graders will provide scores and feedback on your written homework assignments typically within 1-2 weeks upon submission.

Part 1 and Part 2 homework responses are due in pairs on Thursdays at 11:59 PM ET. Make sure to give yourself enough time for submitting your work as we are unable to accept it post deadline. To compensate for assignments not handed in on time due to unanticipated issues that may arise for you, your total homework score is calculated after dropping the two lowest homework scores. This applies separately to Part 1 and Part 2 submissions.

Exams* (LO1, LO2, LO4, LO5): The three exams will evaluate your grasp of the introduced physics concepts and problem-solving abilities. They will assess your progress toward meeting most of the course learning objectives. These assessments will consist primarily of questions similar to those you practiced in the problem sets, on the reading quizzes, workshops and through in-class activities. You will work independently on the exams to gauge your independent facility with describing physical phenomena using the physics concepts, techniques and principles introduced in the course. The first two exams will only cover the material taught prior to the exam, while the final exam will be cumulative. The chapters covered in the exam are listed in the course calendar.

> **Exam 1: Thursday, October 9, 7:00-9:00 PM, Location: Salomon DECI**
> **Exam 2: Thursday, November 6, 7:00-9:00 PM, Location: Salomon DECI**
> **Exam 3: TBA**

Please make sure to take into account the exam dates and times in your planning. Because of the large enrollment in this class, we cannot give tests at other times for individuals except in cases of conflicts due to religious observance, serious illness or emergencies. Those cases must be supported by a note from a Dean and approved by the course manager Prof. Dorca.

Graded exams may be returned for correction of possible grading errors (re-grading) no later than one week after the graded exams are made available (via GradeScope). The exact timing will be announced via Canvas after the graded exams are made available. The regrading requests should be submitted through GradeScope. Re-grading can lead either to an increase or a decrease in grade.

Laboratory Exercises (LO3, LO5): Through these exercises, you will get to work hands-on with some of the phenomena introduced in the course. Labs are designed to deepen your understanding of physics by applying it experimentally. You will complete a total of four labs by submitting a lab report for each. The overall lab component of the course is PASS/FAIL. Lab report scores do not factor into the course grades, but a PASS is required to earn credit for the course irrespective of chosen grade options. More information including due dates and lab materials are available in the *Labs* section of the PHYS0030 Canvas site. Please direct all administrative lab-related questions to the Laboratory Manager, Prof. Tucker. Please direct questions on lab procedures, analysis and write ups to your lab TA.

Allocating your time in this course

Course calendar: The course calendar is posted on Canvas. It gives the schedule of and textbook readings for each class meeting. It shows the lab and workshop meeting weeks and the exam dates. It includes the due dates for the homework assignments.

Weekly Schedules and Estimation of Your Hours of Effort: There are three types of weeks over the semester: Workshop, Lab, and Exam weeks. The table below provides an estimate of the hours a typical student devotes to different activities on each type of week and includes an estimate of the total hours that a typical student is likely to devote to this course. You will notice that most of the hours are associated with activities outside of class. We will do our best to guide you on how to engage with the material to learn it during the relatively short periods of time that we are with you.

Workshop week		**Lab week**		**Exam week**		**Other Activities**	
Activity	**Hours**	**Activity**	**Hours**	**Activity**	**Hours**	**Activity**	**Hours**
Pre-class work (x3)	2.5	Pre-class work (x3)	2.5	Pre-class work (x3)	2.5		
Class (x3)	2.5	Class (x3)	2.5	Class (x3)	2.5	Exam 3 study	7
Class review (x3)	2.5	Class review (x3)	2.5	Class review (x3)	2.5	Final Exam	3

Workshop	1.5	Lab	2	Exam and study	7	Lab reports	24
Homework	3	Homework	3	Homework	0		
Total hours per week	**12**	**Total hours per week**	**12.5**	**Total hours per week**	**14.5**		
Total for 7 workshop weeks	**84**	**Total for 4 lab weeks**	**50**	**Total for 2 exam weeks**	**29**	**Total for other activities**	**34**
TOTAL HOURS: 197							

Prerequisites

This course assumes no prior knowledge of physics. Prior to taking PHYS0030, you do not need to have had any training in Newtonian mechanics. You will be employing algebra, geometry, trigonometry, and analytic geometry extensively, so it is important that you are familiar with these subjects. Students who have had some high school physics preparation and are comfortable with basic calculus, or have taken calculus at the MATH0100 level, should strongly consider taking PHYS0050 instead.

Shopping period and no makeup policy

The scope of physics coverage over the semester demands the timely completion of various assignments. However, the syllabus is designed to accommodate the shopping period so that students can commit to the course near the end of the shopping period without a heavy penalty. The earliest assignments are due no earlier than Thursday of the second week. We encourage you to not defer completing assignments, particularly pre-lecture assignments, to keep pace with the lectures.

The size of the class makes it challenging to grant and handle missed assignments ad hoc. Thus, we have detailed above how a fraction of each group of assignments is waived towards the total course score. These waivers are built to accommodate shopping period, illness, or other issues. With such considerations already factored into the grading scheme, please be clear and share your understanding with academic deans that we cannot handle makeup assignments beyond the exams.

Academic Support

Supplemental Study Resources

There are more resources available that can support your learning and mesh with your efforts to prepare for class, do homework problems, review material from the textbook and class as well as prepare for exams. They include conference sessions, office hours, and group tutoring. The benefits of taking advantage of these resources include:

getting feedback on your thinking
finding study partners
getting problem-solving instruction and tips
hearing new perspectives that help you learn faster

Resource	Timing	Purpose
Office Hours with TAs or Faculty	See Course Information on Canvas	For questions about course material, assigned problems, and learning strategies in groups or one-on-one.
Group tutoring either at Science Library Science Center	Group Tutoring (3-5 students): Students are invited to submit group tutoring requests during the Open Access period.	For practicing problems, discussing course material, and discussing learning strategies.

Accessibility and Accommodations

Brown University is committed to full inclusion of all students. Please inform the course manager early in the term if you may require accommodations or modification of any of course procedures. You may speak with the course manager during his office hours, or by appointment. If you need accommodations around online learning or in classroom accommodations, please be sure to reach out to Student Accessibility Services (SAS) for their assistance (sas@brown.edu, 401-863-9588). Undergraduates in need of short-term academic advice or support can contact an academic dean in the College by emailing college@brown.edu. Graduate students may contact one of the deans in the Graduate School by emailing graduate_school@brown.edu.

English Language Support

Brown welcomes students from around the country and the world, and their diverse perspectives enrich our community. A suite of services is available to support students whose primary language is not English. International and multilingual students are encouraged to take advantage of these supports to enhance any aspect of their English use or cross-cultural communication through The Harriet W. Sheridan Center for Teaching and Learning at 401-863-1219 or

sheridan_center@brown.edu.

PHYS0030 Learning Environment

We are aiming to create a learning environment in which all of our students have the space and feel encouraged to develop and if they like, share their own way of understanding and mastering the physics material in this course. Achieving this aim requires supporting the diversity of thoughts, perspectives, and experiences that our students bring to the course and honoring students' identities (including race, gender, class, sexuality, religion, ability, etc.). To help accomplish this:

- If your name and/or pronouns differ from those appearing in your official Brown records, please let us know.
- If you feel like your performance in the class is being impacted by your experiences outside of class, please don't hesitate to talk with us. We want to be a resource for you. Remember that you can also submit anonymous feedback (which may lead to the instructor making a general announcement to the class, if necessary, to address your concerns). If you prefer to speak with someone outside of the course, the Office of Diversity and Inclusion is an excellent resource.
- We (like many people) are still in the process of learning about diverse perspectives and identities. If something was said in class that made you feel uncomfortable, please talk to us about it. (Again, anonymous feedback is always an option).

Use of Technology to Support Your Learning in This Course

This course will use the following technological platforms: Canvas, Achieve, GradeScope, and Ed Discussions. We are committed to ensuring access to online course resources by students. If you have any concerns or questions about access or the privacy of any of these platforms, please reach out to us.

The IT Service Center (https://it.brown.edu/get-help) provides many IT Services including remote assistance, phones, tickets, and chat.

Harassment

Harassment of any form — including, but not limited to, offensive comments related to gender, sexual orientation, disability, physical appearance, body size, race, or religion — will not be tolerated under any circumstances.

Academic Conduct

You are expected to follow the University Academic Code. If you have questions about how it applies to your work in this course, please do not hesitate to ask us for clarification.

Collaboration

We encourage you to discuss all homework assignments with your peers, but the exercises themselves must be completed independently. Here are some points to keep in mind about collaboration:

- Do not write down something that you cannot explain to the teaching team.
- When you are helping other students, avoid showing them your work directly. Instead, explain your solution verbally.
- If you find yourself reading another student's solution, do not write anything down. Once you understand how to solve the problem, remove the other person's work from your sight and then write up the solution to the question yourself. Looking back and forth between someone else's paper and your own paper is copying.
- If one of us writes down part of a solution in order to help explain it to you or the class, you cannot copy it and hand it in for credit; treat it the same way you would treat another student's work with respect to copying, that is, remove the explanation from your sight and then write up the solution yourself.
- There is often more than one way to solve a problem. Choose the method that makes the most sense to you rather than the method that other students happen to use. If none of the ideas in your solution are your own, there is a good chance it will be flagged as copying.