

Syllabus for PHYS 0174

Basic Physics for Science and Engineering 1

Spring 2016

Course Information

CRN	11259
Location	Alumni Hall 343
Lecture	Tuesday and Thursday 1:00 – 2:45pm
Text	<i>Fundamentals of Physics, 10th Custom Edition</i> by Halliday, Resnick and Walker
Prerequisites	High school algebra and trigonometry; Math 0220 is a co-requisite for Physics 0174



Instructor	Russell J. Clark, Ph.D.
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Office	OEH 404
Office hours	Monday: 4:30pm – 5:30pm Tuesday: 8:00am – 9:00am Wednesday: 3:00pm – 4:00pm Thursday: 10:30am – 11:30am Friday: 7:00am – 8:00am Other times by appointment: http://tinyurl.com/Russell-Clark-Appointments

Text and Materials

The textbook for this course is *Fundamentals of Physics, 10th Custom Edition* by Halliday, Resnick and Walker and is available in the university book stores. In addition, you will need a scientific calculator with trigonometric, logarithmic and exponential functions.

Course Description and Objectives

Course Description: Physics 0174 is the first term of a two-term calculus-based introductory lecture-demonstration sequence in physics primarily for students intending to major in a field of science or engineering. Calculus is used as needed, and should be taken at least concurrently. Topics covered in Physics 0174 include: kinematics, Newton's Laws of Motion, work, kinetic and potential energy, conservation of total mechanical energy, linear momentum, conservation of total linear momentum, rotational kinematics and dynamics, rigid body motion, conservation of angular momentum, elasticity, gravitation, simple harmonic motion, waves and sound. The laboratory course associated with Physics 0174/0175, Physics 0219, should be taken after Physics 0174.

Objectives: A student will be able to:

- 1) Demonstrate conceptual understanding of the concepts, principles and laws of physics covered in this course, which include: kinematics, Newton's Laws of Motion, work, kinetic and potential energy, conservation of total mechanical energy, linear momentum, conservation of total linear momentum, rotational kinematics and dynamics, rigid body motion, conservation of angular momentum, elasticity, gravitation, simple harmonic motion, waves and sound.

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- 2) Describe a physical situation, as necessary, using multiple representations such as written conceptual statements, mathematical equations, diagrams, and graphs, and be able to translate from one representation to another.
- 3) Perform a conceptual analysis of a problem and identify physical principles required for its solution.
- 4) Translate physical principles to formulate necessary mathematical statements required to solve a problem.
- 5) Apply mathematical concepts and methods such as algebra, differentiation, integration, trigonometry, and vector analysis as necessary to analyze and solve problems.

Course Schedule¹

Lecture	Date	Chapter	HW Due
1	Thursday, January 07, 2016	1	
2	Tuesday, January 12, 2016	2	
3	Thursday, January 14, 2016	3	1
4	Tuesday, January 19, 2016	4	2
5	Thursday, January 21, 2016	5	3
6	Tuesday, January 26, 2016	6	4
7	Thursday, January 28, 2016	6	5
8	Tuesday, February 02, 2016	7	6
9	Thursday, February 04, 2016	8	7
	Tuesday, February 09, 2016	Exam 1	
10	Thursday, February 11, 2016	8	8
11	Tuesday, February 16, 2016	9	9
12	Thursday, February 18, 2016	9	10
13	Tuesday, February 23, 2016	10	11
14	Thursday, February 25, 2016	10	12
15	Tuesday, March 01, 2016	11	13
16	Thursday, March 03, 2016	11	14
	Tuesday, March 08, 2016	Spring Break	
	Thursday, March 10, 2016	Spring Break	
17	Tuesday, March 15, 2016	13	15
18	Thursday, March 17, 2016	13	16
	Tuesday, March 22, 2016	Exam 2	
19	Thursday, March 24, 2016	13	17
20	Tuesday, March 29, 2016	15	18
21	Thursday, March 31, 2016	15	19
22	Tuesday, April 05, 2016	16	20
23	Thursday, April 07, 2016	17	21
24	Tuesday, April 12, 2016	17	22
25	Thursday, April 14, 2016	17	23
26	Tuesday, April 19, 2016	18 ²	24
27	Thursday, April 21, 2016	18	25

¹ This is only a suggested schedule. The actual pace of the class may vary.

² Chapter 18 is optional and will only be covered if there is sufficient time.

Course Grades

Your grade in this course will be based on questions asked in the lecture, the homework assignments, recitation quizzes and exams. These grades will be weighted according to the table below.

Lecture Questions	5%
Quizzes	15%
Homework	20%
Exam 1	20%
Exam 2	20%
Final Exam	20%

Lecture Questions: The lecture hall is equipped with a Student Interactive Response System (SRS) which consists of hand-held radio transmitters, called clickers, used by the students to answer multiple choice questions. At the beginning of the semester you will be assigned a number that corresponds to a particular clicker and you will use that same clicker throughout the semester. The clickers will be stored in bins on carts at the front of the room so that you may pick up your clicker as you enter the hall and then place it back there as you leave. **Do not take your clicker out of the classroom!** The clickers are checked at the end of every lecture so we know the last person to use a clicker should it turn up missing. The clickers in the lecture hall will not work with other SPS systems on campus.

Please observe the following rules for the clickers:

1. Memorize your clicker number and where it is located on the cart.
2. Pick up your clicker as you enter the classroom.
3. If your clicker is missing, check nearby bins as it may have been misplaced. If you still cannot find it then record this on the clicker sheet.
4. **Do not pick up a clicker that is not assigned to you or use more than one clicker (such as when a friend is absent).**
5. Answer the multiple choice questions by pushing the appropriate key on your clicker.
6. Record any sort of technical issue with your clicker (such as a dead battery, error light, etc.) on the clicker sheet at the end of class.
7. **Place the clicker back in the proper bin at the end of lecture.**

During the lectures the instructor may pose multiple choice questions. You will be given some time to think about each question and discuss it with your neighbors. During this time the SRS receiver will pick up all of the responses and tally the results. The questions are intended to motivate discussion with your peers and to provide the instructor with feed-back on how well you understand the material. You will receive full credit (100%) for each question that you answer correctly and 80% for each question that you answer incorrectly. Failure to answer a question at all results in no credit (0%), so it pays to answer the question even if you get it wrong.

Exams: There are two midterm exams and a final exam (see the schedule for the dates). Each exam, including the final, is worth 20% of the course grade.

Homework: Problem solving skills are important to learning and understanding physics and so homework is an important part of this course. We will use the LON-CAPA online homework system:

<http://homework.phyast.pitt.edu/>

Your username for this system is the same as your Pitt email account, but your initial password will be your PeopleSoft number which is available through my.pitt.edu. If you have used LON-CAPA in a previous course, then your password is the same as it was before. If you have any trouble logging into the system then click “Forgot Password?” on the login screen and follow the instructions there. Please contact Dr. Clark or your TA if you have any questions about using the system.

Each problem in LON-CAPA is generated uniquely for each student in the course. Therefore the problems assigned to you will be similar, but not identical, to problems assigned to other students. Each problem has a discussion board and you are encouraged to use this feature to ask questions and offer insights to other students. The discussion boards will be monitored by Dr. Clark and the TAs. **You MAY NOT post solutions to the problems on the discussion board! Posting a solution to a problem will be considered an academic integrity violation and will result in disciplinary action.**

A homework set will be assigned immediately after each lecture and it will be due one week later. No assignments will be due on the day of an exam. You will also turn in written, worked out solutions for each assignment in the next recitation after the due date for that assignment.

Where to Get Help

If you have any questions about the homework problems or anything else then contact your TA or Dr. Clark. In addition, the Department of Physics and Astronomy provides free assistance for all students. The **Physics Help Room** is staffed with TAs who can answer homework related questions, explain basic concepts and help you with the math. This is a free service and you are encouraged to use it. The Physics Help Room is located in Thaw 312 (http://www.physicsandastronomy.pitt.edu/resource_room). You may also receive free tutoring through the Academic Resource Center (<http://www.asundergrad.pitt.edu/offices/arc/>).

Courseweb

The University of Pittsburgh provides an online portal for classes called Courseweb. Here you will find relevant course material such as a copy of the syllabus, sample exams, etc. You may also view your grades online through this site.

<http://courseweb.pitt.edu>

Grade Change Policy

Grade cutoffs are chosen to be as fair as possible but ultimately the line has to be drawn somewhere and it has to be drawn straight. Extra credit opportunities will not be offered to individual students. Once your final grade for the semester has been submitted to the Registrar it will not be changed unless there is a verifiable error in the grade book, such as a missing grade or a grade that was entered incorrectly. You can check all of your course grades at any time on Courseweb (<http://Courseweb.pitt.edu>).

Academic Integrity

All students are expected to adhere to the standards of academic honesty. Any student engaged in cheating, plagiarism, or other acts of academic dishonesty would be subject to disciplinary action. Any student suspected of violating this obligation for any reason during the semester will be required to participate in the procedural process, initiated at the instructor level, as outlined in the University Guidelines on Academic Integrity (<http://www.provost.pitt.edu/info/acguidelinespdf.pdf>). This may include, but is not limited to the confiscation of the examination of any individual suspected of violating the University Policy.

Disability Services

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and Disability Resources and Services, 216 William Pitt Union, (412) 648-7890/(412) 383-7355 (ITY), as early as possible in the term, DRS will verify your disability and determine reasonable accommodations for this course.

Statement on Classroom Recording

To ensure the free and open discussion of ideas, students may not record classroom lectures, discussion and/or activities without the advance written permission of the instructor, and any such recording properly approved in advance can be used solely for the student's own private use.