Physics 141

Mark Kendall and Niloofar Kamran

November 2018 (Block 4)

This course is the first course in the introductory physics sequence PHY 141-142. Your main goal in this course is to understand and appreciate that all natural phenomena can, in theory, be explained using a small number of fundamental laws and ideas. You'll learn how to apply these fundamental laws and empirical relations to explain simple mechanical phenomena. You will also learn how to improve logical reasoning and problem-solving skills. You will also apply your knowledge of physics to understand concepts in other fields.

This course supports the Educational Priorities and Outcomes of Cornell College with emphases on knowledge and reasoning.

The main text for this course is Giancoli, *Physics* (6th Ed, 2005), although any recent edition of this text is also sufficient. It is important for you to read the text, since it often takes several times going through the material for it to sink in. You will also need a calculator; a graphing calculator (e.g. Ti-83) is *strongly recommended*.

The schedule for this course is somewhat unusual. Except for a few special days (first day of class and exam days) you will attend one of two lab sessions in the morning. When you are not in morning lab (**Norton room 308**), you can get help with homework in the classroom (**Norton room 208**). The generic weekly schedule is shown in the table below.

Day	Time	Mornings	
		Group A	Group B
Mon	8:30	Lab	HW Help
	9:45	HW Help	Lab
Tue	8:30	Lab	HW Help
	9:45	HW Help	Lab
Wed	8:30	HW Help	Lab
	9:45	Lab	HW Help
Thur	8:30	HW Help	Lab
	9:45	Lab	HW Help
Fri	8:30	Lab	HW Help
	9:45	HW Help	Lab

Everyone will meet in **Norton 208 from 1:00-3:00PM** to learn the new material. There is no lab on the first day of class, so everyone will meet at 9:05AM on the 1st Monday (this will allow you to attend the official opening of Russell Science – there should be breakfast items!). The first two exams will be given at 12:30PM on the 7th day (2nd Tuesday of the block) and 13th day (3rd Wednesday of the block). Homework help will be given on the mornings before the exams and there will be no lab on the morning of an exam. On the 17th day (4th Tuesday) there will be a comprehensive review of the material. The final exam will consist of problems from the final third of the course in addition to problems covered in the first two exams.

Contact Information and Office Hours: Mark Kendall will conduct the lecture portion of this course, while Niloofar Kamran will conduct the laboratory portion of this course. Mark's contact information is:

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Niloofar's contact information is:

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For office hours, I will make myself available Tuesdays 8-9PM in Russell 204, and Thursdays 8-9PM in Zamora's. When not teaching, Niloofar or I are usually in our respective offices (other than meetings). Please feel free to stop by to ask for help or questions. I can always be reached by e-mail.

Grade: There are three exams: the first exam is 20% of your grade, while the second exam and final are each 25%. Homework (and possible quizzes) constitutes 10% of your grade. 15% of your grade consists of lab work and reports. Participation counts for 5%.

Math: Two years of high school algebra including trigonometry is a prerequisite for this class. If you are uncertain of your math abilities, or you need to brush up on some skills, please take advantage of the Quantitative Reasoning Studio (QRS) in Cole Library 322. You may speak with Jessica Johanningmeier, the Director of the QRS, during the day, or a peer consultant in the evenings. See their website for hours. Please let me know if they are not able to help you.

Homework Problems: Physics must be done to be understood. Solving problems is one of the best aids in learning the material. Each day you will receive about 6-10 homework problems (which I will post on Moodle), which you should attempt to solve before the next morning session. Some of these problems will probably be too difficult for you to solve right away. *Do not increase your frustration by spending more than about 20 minutes on any problem if you are not making any progress*. We will have time in the mornings for you to tackle any difficult problems, (but *not* enough time for you to start the homework from scratch.) Unlike the exams, you are welcome to work with your classmates on the homework assignments; however, you must gain sufficient proficiency with the material such that you are able to understand everything you have written down (and be able to demonstrate this). A check will be made to see if you made an honest effort on submitted homework, and 2-3 problems will be graded each night. Homework is due at 1:00PM on the day after it was assigned. Homework turned in up to a day late will be penalized 20%; if it is turned in later than this, it will generally not receive credit. Homework is graded primarily to give you some incentive to turn it in. Any student who works diligently should manage to get a homework score of well over 95%. Check solutions posted on Moodle to make sure that you finished all problems correctly.

Labs: Labs in this course will emphasize learning the material through hands-on exercises. Labs are an integral part of this course and you are expected to complete every lab exercise, which consists of an activity and its associated lab response and lab problem. You will be allowed to make up two lab exercises under the circumstance that you are unable to attend the lab activity during the time it is scheduled because of a planned absence for a college activity, an illness, or a family emergency. You must arrange with the lab instructor a time for you to make up the labs (typically, the morning before an exam.)

Keeping up with the material: The ideas in a physics class build on each other, so you must understand the material we have already covered in order to understand any new material. It is imperative that you study every day and that you work on all of your homework problems every night. You should keep one sheet in your notebook with all of the equations that we have used so far, along with definitions of the variables and a description of when the equation applies. Each day after class, you should review the concepts from the day, and make notes for yourself about ideas that you want to remember.

Conceptual understanding: Many of the ideas in PHY 141 may make a lot of sense as they deal with physical phenomena with which you are familiar, such as the behavior of a ball thrown from one person to another in a sport like basketball. However, some of the concepts that we'll look at are very counter-intuitive, so your best approach to understanding them is to gain practice through the homework problems as well as doing the labs. Although we'll study some very odd phenomena in this course, you will have the opportunity to do experiments which should help you gain some conceptual understanding of these abstract concepts.

Asking for help: Please ask me for help when you need it. You may need the answer to a specific question, or you may find yourself struggling with a larger issue in the class. I am happy to work with you on small and large issues. I like to talk to students outside of class. To get in contact with me, you can see me at the end class, e-mail me, call me in my office, or stop by my office. I will check my e-mail several times a day, including the evenings, so for less urgent questions in the evening you can e-mail me. If you are struggling with material, you are also encouraged to visit either the Quantitative Reasoning Studio (see above), or the Academic Support Office, where Brooke Paulsen (bpaulsen@cornellcollege.edu) can assign you a tutor.

Attendance: Attendance is mandatory; I expect you to be on-time and prepared for each morning and afternoon. The participation component of your grade will reflect your attendance and participation in class (such as answering questions and filling out your daily notecard). You may be absent from class due to a few reasons. Your absence is excused if either 1) you obtain permission from your instructor in advance of the absence or 2) the absence is of an emergency or medical nature. If your absence is excused, you will need to make up the material that you missed, but there will be no other penalty. If your absence is not excused then you will not be allowed to make up the work. Questions about in-class demonstrations or exercises are fair game for exams.

Academic Integrity: Unless otherwise stated, assignments are for you to complete on your own. In some cases, they will be based on group work done in class. In these cases, please provide proper attribution to other's ideas. Failure to properly reference other people's ideas may result in a failing grade. Cornell College expects all members of the Cornell community to act with academic integrity. An important aspect of academic integrity is respecting the work of others. A student is expected to explicitly acknowledge ideas, claims, observations, or data of others, unless generally known. When a piece of work is submitted for credit, a student is asserting that the submission is her or his work unless there is a citation of a specific source. If there is no appropriate acknowledgement of sources, whether intended or not, this may constitute a violation of the College's requirement for honesty in academic work and may be treated as a case of academic dishonesty. The procedures regarding how the College deals with cases of academic dishonesty appear in The Compass, our student handbook, under the heading "Academic Policies Honesty in Academic Work."

Any student found cheating on a test will receive a zero on the test. The Registrar will also be notified.

Accommodations and Learning Styles: Cornell College makes reasonable accommodations for persons with disabilities. Students should notify the Coordinator of Academic Support and Advising and their course instructor of any disability related accommodations within the first three days of the term for which the accommodations are required, due to the fast pace of the block format. For more information on the documentation required to establish the need for accommodations and the process of requesting the accommodations, see http://www.cornellcollege.edu/academic-support-and-advising/disabilities/index.shtml or contact Brooke Paulsen at bpaulsen@cornellcollege.edu.

Tentative Schedule:

Day	**Material Started in Afternoon Class**	**Relevant Sections from the Text**
Monday Day 1	Interactions; Vectors	Sections 1 –5,6 and 2 – 1 Sections 3 –1,2,3,4.
Tuesday Day 2	1-D Motion; Motion Diagrams	Skim Sections 1 –1,2,3,4,7,8. Read Sections 2 –2,3,4,5,6,7
Wednesday Day 3	Graphing Motion; 2-D Motion, Free-body Diagrams	Sections 2 – 8 (first 6 paragraphs) Sections 3 – 5,6
Thursday Day 4	Gravity, Normal force, Tension, Friction	Sections 4 – 1,2,3,4,6,8
Friday Day 5	Inclines, Springs, Drag, 3rd Law, Circular Motion	Sections 4 –5,8,9 Sections 5 – 1,2,3
Monday Day 6	Universal Gravitation, Conservation of Energy	Sections 5 – 6,7,8 Sections 6 – 4,6,7
Tuesday Day 7	9:00 a.m. Help Session (no new lab) **12:30 – 3:00 Exam 1** over chapters 1 – 5	
Wednesday Day 8	Work, Thermal Energy, Power, Linear Momentum	Sections 6 – 1,8,9,10 Sections 7 – 1,2

Thursday Day 9	Collisions, Center of Mass, Rotational Kinetics, Torque	Sections 7 – 6 (Skim ideas from 7 – 4,5,7) Sections 8 – 1,2,3,4,5
Friday Day 10	Rotational Dynamics, Rotational Energy, Angular Momentum	Sections 7 – 8,10 Sections 8 – 6,7,8
Monday Day 11	Statics, Fluid Pressure	Sections 9 – 1,2,3 Sections 10 – 1 through 6
Tuesday Day 12	Buoyancy, Fluid Flow	Sections 10 – 7 through 12
Wednesday Day 13	9:00 a.m. Help Session (no new lab) **12:30 – 3:00 Exam 2** over chapters 6 – 9	
Thursday Day 14	Vibrations, Waves, Intensity	Sections 11 – 1,2,3,5,6,7,8,9,11,12
Friday Day 15	Standing Waves, Resonance, Sound	Sections 11 – 13 Sections 12 – 1,2,4
Monday Day 16	Spectra, Beats, Doppler Effect	Sections 12 – 5,6,7
Tuesday Day 17	9:00 Lab Makeup or HW help	1:00 Exam Help Session
Wednesday Day 18	**9:00 – 12:00: Final Exam** (comprehensive) 12PM: Regret that PHY141 is finished so soon!	

The instructor reserves the right to amend the schedule and the syllabus.
You will be notified of any changes.