Physics 202: Intro Physics I

Fall, 4 Units (3 Lecture, 1 Lab)

MWF 9:30-10:20 AM — Room: Bullock G-09

Prof. Nicole Ackerman

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Office: Bullock 106W — 404-471-5627

1 Course Description

From Catalog: A calculus-based course with laboratory covering Newtonian mechanics, oscillations, and other classical physics topics.

Note that this course is part of a two-semester Introductory Physics sequence. We will focus on motion, oscillations, and thermodynamics in the class. Electricity and magnetism will be covered in the Spring Semester (Physics 203).

1.1 Course Goals

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

1. Create and analyze representations of the physical interactions between objects. (Representing)
2. Predict outcomes through identifying significant physical principles and constructing mathematical models. (Problem Solving)
3. Clearly present the approach and results of physics modeling and calculations. (Communicating)
4. Assess the contributions of team members, analyze team feedback, and implement changes to improve group effectiveness. (Collaborating)

You will see these 4 student learning outcomes (SLOs) show up again and again in this class. For assignments and activities, I will do my best to highlight which SLOs you are developing. When I talk about the SLOs, I will usually use the "nickname" that appears in parentheses above. While not identically worded, note that many of the SLOs for this course relate to the Summit Student Learning Objectives (found on page 40 of the 2016-2017 Academic Catalog):

4. Communicate effectively through writing and speaking, especially across cultural or linguistic differences (Communicating)
5. Recognize, analyze, and evaluate arguments (Problem Solving)
7. Recognize, analyze, and employ effective teamwork (Collaborating)
10. Interpret quantitative information or demonstrate the methods of inquiry appropriate for investigating the natural world (Problem Solving)

Most students who take PHY202 and PHY203 are not physics or astrophysics majors, but the learning outcomes are also aligned with some of the departmental learning objectives:

1. Formulate an approach to solve fundamental problems of physics or astrophysics, using the necessary mathematical skills (Problem Solving)
4. Employ scientific modeling, analysis, and visualization tools (Representing)

1.2 Intended Audience

This course is for physicists, engineers, chemists, biologists, biochemists, neuroscientists, and anyone with experience in calculus who is interested in understanding the fundamental rules that govern the world around us. This class will use examples from real life situations, in addition to applications in engineering, biology, and medicine.

Pre-requisites Calculus, Mat-119 (Co-requisite). We will work with basic derivatives and integrals in the first week of the course. Students should be able to take derivatives and integrals of polynomial, trig, and exponential functions, use trigonometry to calculate angles and sides of right triangles, and manipulate equations using algebra. Many students are still developing these skills, and resources will be provided that review and help students practice.

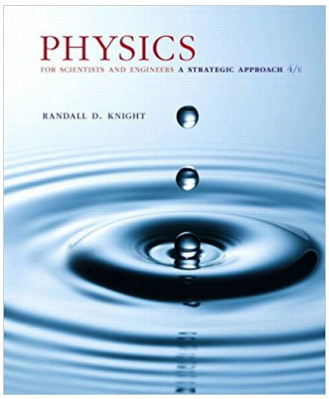
2 Course Details

Credits:	4 Credits	3 Lecture, 1 Lab
Class Sessions:	MWF 9:30-10:20 AM	Bullock G-09 (Teasley)
Lab Sessions:	Monday 2:00-5:00	Bullock 104W
	Tuesday 2:00-5:00	Bullock 104W
Office Hours:	Monday 2:00 - 3:00 PM	Bullock 106W
	Monday 7:00 - 8:00 PM	Bullock 106W
	Thursday 10:00 - 11:00 AM	Bullock 106W
	Friday 10:30 - 11:30 AM	Bullock 106W
	Friday 1:00 - 2:00 PM	Bullock 106W
Workshop Leader:	Alexa Chang	
Course Tutors:	Jenny Bates, Kira Frische	

Almost every week you will spend about 3 hours in lecture and 3 hours in lab. You should expect to spend *at least* 4 hours per week preparing for class before Monday, which will include reading the textbook, watching videos, and following online MasteringPhysics tutorials. You should expect to spend *at least* 3 hours per week on assignments that will be submitted, of which there are a few types. Please see the later sections (5 and 6) for more information on these parts of the class.

2.1 Required Materials

Strongly Recommended Textbook: *Physics for Scientists and Engineers, 4th Ed* By Randall Knight
Required Online Software: *MasteringPhysics for Knight, Physics for Scientists and Engineers, 4e*
The software can be purchased online through Pearson *without the book* for $69. For $116 you can purchase the software with an electronic copy of the book (through the MasteringPhysics website). Please note that if you purchase a used copy of the book (or rent it), you will still need to purchase the software. The same textbook and software will be used in the spring semester for Physics 203.



3 Assistance for Building Your Skills

There are many resources available to help you build your skills in this course. Myself, the textbook, and assignments may be the most obvious ones, but there are additional tools that can be used if you want to improve your skills and performance.

3.1 Moodle

I will heavily use Moodle, including posting resources and assignments. There is a class forum which I encourage you to use to ask questions! It is possible that another student has the same question, so sharing the question and answer with everyone is beneficial. I will try to reply to questions on Moodle as soon as I see them, but occasionally I am away from the computer for hours at a time. You should typically expect a response within 24 hours. I will notify the class if I am traveling and Moodle responses will be slower.

3.2 Videos

I post links to two types of videos: problem solving videos (PSV) and lecture videos (LV). In class we will focus on activities where *you* (the students) are practicing physics, so videos are the manner in which I will 'deliver' information and examples to you.

3.3 Office Hours and Appointments

Questions are often addressed quickest in person, so I encourage you to come to office hours with any and all questions. I have "open" office hours, meaning that I leave the door open so students can come and go as needed. Many of you may have the same challenges with certain problems, so I encourage group discussions. If a student comes later with a question that has already been answered, I may ask one of the students present to explain. Teaching is a great way to learn!

If you are unable to make it to my normal office hours or wish to meet one-on-one, please schedule an appointment with me. Use **Compass** to book an appointment during one of my appointment slots (separate from office hours). These appointments can be used for homework, general questions, or advising.

Due to my teaching schedule (and appointments with students), I may not be available if you just drop by my office. Please note that I will not be available to help with homework right before it is due. If you have questions on an assignment that you will be submitting late (see subsection 4.1), make sure to schedule an appointment - I will not provide assistance with late assignments during office hours out of respect of other students' time.

3.4 E-mailing and Calling Me

Typically, I will not see e-mail any quicker than Moodle posts. Of course, I'm happy to address questions and concerns through e-mail that you don't want to share publicly. Using e-mail is preferrable to the phone; the phone sits on my desk, while I am usually near an e-mail (and Moodle!) retrieving device. I don't always check e-mail during the weekends, but I will try to reply to e-mail within 24 hours during the weekdays.

3.5 Science Learning Center and Workshop

There will be additional assistance offered through the Science Learning Center and a weekly workshop. Attending the Workshop sessions is highly beneficial, but it is difficult to schedule workshop at times that enable all students to attend. Workshop times and tutoring hours are posted on Moodle.

Note that tutors can help with homework, but that help is not a guarantee that your work is flawless. Make sure that you understand how homework will be evaluated. The homework evaluation is different this year, so tutors will not be able to provide accurate judgments of how things will be graded.

3.6 ADA

Agnes Scott College seeks to provide equal access to its programs, services and activities for people with various abilities. If you will need accommodations in this class, please contact the Office of Academic Advising and Accessible Education (404-471-6150) to complete the registration process. Once registered, please contact me so we can discuss the specific accommodations needed for this course."

4 Evaluation

Grades will be determined by the following percentages. Please see subsequent sections for information on what each assignment is; many have sub-categories.

Type of Assignment	Total Percent of Grade
Tests	16%
Final	15%
Weekly Problems	10%
MasteringPhysics	10%
TBL	15%
Assessment	2%
CATME	12%
Lab	20%

There will also be some extra credit opportunities throughout the course. The point value (and category) will be announced ahead of time. These extra credit opportunities may require attendence of events (such as Observatory open houses), writing, or completing online activities. My standard late penalty applies and I may give partial or no credit if the work is low quality.

4.1 Late Assignments and Makeup Tests

Assignments have a specific date and time they are due. Tests have a specific class period they will be given. This information is available far ahead of time so that you can arrange your schedule accordingly. If you turn in an assignment late, you will lose 20% for every day it is late, including days of the weekend. Assignments turned in after homework has been graded will not be accepted. You should e-mail me to co-ordinate where you will turn homework in if it is late.

Problem sets and MPHW should be submitted during class. I offer a "grace period" until when I leave campus that day, if you are unable to submit these assignments to me during class. Please

e-mail me to let me know that you will be submitting the assignment late, and leave the assignment in the clear box outside my office. Please do not slide the assignment under my door, and please do not e-mail me scanned or photographed copies of the assignment.

The policies for online assignments are slightly different. MasteringPhysics Exercises (submitted online) begin accruing a "late penalty" as soon as they are due - this penalty is applied to incomplete problems, but not those already finished. The CATME and physics assessment online assignments *cannot* be submitted late. You will receive a zero if they are not complete on time.

If you miss a class where a test was given and did not contact me ahead of time, you will receive a zero on that test. Accommodations may be made in two cases: if you contact me to reschedule a test *at least one week ahead of time* or if you have a medical or family emergency. These issues will be dealt with on a case-by-case basis. I am flexible about rescheduling tests if you have many tests occurring on the same day or a reasonable conflict, but you *must take the test ahead of when the rest of the class takes it.*

TBL quizzes are unique in that they have a team-based component. If you are going to miss a class with a TBL quiz, you may take the individual component on the previous Friday (make sure to e-mail me at least a week ahead of time). If you are sick or otherwise unexpectedly miss class on Monday, you may take the individual component before class on Wednesday (you *must* e-mail me to arrange this). It is not possible to "make up" the team part, but note that the lowest two TBL individual and team grades are dropped.

4.2 Grades

The final grades will be determined according to the following percentages. Descriptions are provided only as a guideline: grades cannot be negotiated.

A: 93-100 A-: 90-92	The student extensively prepared for class, made significant contributions to their team, and turned in all assignments on time. Tests and assignments demonstrated clear organization of work, careful modeling, and appropriate use of representations.
B+: 87-89 B: 83-86 B-: 80-82	The student prepared for class, fully participated in their team, and turned in assignments on time. Tests and assignments were largely correct, but the work sometimes lacked clear organization or did not represent careful physics problem solving.
C+: 77-79 C: 73-76 C-: 70-72	The student often was unprepared for class and minimally participated in their team. Some assignments were turned in late or incomplete. Assignments may have had many mistakes, and tests showed little attention to representation, problem solving, and clear communication.
D+: 67-69 D: 63-66 D-: 60-62	The student missed classes, was unprepared when present, and did not contribute to their team. Some minor assignments were not turned in, or many were turned in late. Low test scores reflect inattention to the core goals of the class.
F: <60	The student missed numerous classes. Assignments were turned in late or not at all. The student's performance on tests shows a lack of preparation and misunderstanding of the core material of the course.

5 Preparing for Class

The structure of this course presumes that, as an intelligent and hard-working college student, you can learn some terminology and ideas before coming to class. This leaves class time for working with other students and getting help from the instructor. Preparing for class is therefor the *most essential* aspect of this course.

Because each student has a different level of background knowledge, schedule, and preferred delivery format, I am providing three different ways to prepare. The goal is for *each* to cover the majority of material that will (possibly) appear on the TBL, and pages titled "Prep Guidance" on Moodle will help you identify what you are responsible for learning before classtime. You should use more than one method on the topics that you are struggling with.

5.1 Textbook Reading

The traditional way to learn foundational material is to read a textbook (Knight, 4th edition), and that option is available to you: the weekly reading assignments are posted to Moodle.

5.2 Videos

I have recorded the Lecture Videos (LV) are filmed to cover the topics presented in the textbook. Most are screencasts (showing slides with a voiceover) but others may show me lecturing in a classroom. The name reflects the core topic presented in the video, which may correspond to a specific section of the book. The videos vary in length, typically under 10 minutes, but multiple videos may be associated with a single topic.

5.3 MasteringPhysics Pre-class Tutorials (MPPCT)

You can also prepare through "optional" MasteringPhysics tutorial questions. These questions are largely conceptual and usually have many hints to help guide you through. Please note that these will not factor into your grade, and that they can be completed later in the semester to review. While I have tried to choose tutorials that provides coverage of the important ideas of the relevant sections of textbook, there may be certain items from the "Prep Guidance" that are not in the MPPCT. If you use these tutorials as your primary method of preparation, you will likely need to add some textbook reading or videos to fill in those holes.

6 Assignments

6.1 Team Based Learning (TBL)

Most Mondays will begin with a TBL quiz. You will have an initial period of time during which you complete the TBL quiz on your own, and then you will have an opportunity to retake the quiz with your team. You will receive an individual score, and then everyone (present) on your team will receive the same team score. Further information will be presented in class and posted to Moodle. Please see 4.1 for information on missing class on TBL days. Note that the two lowest individual scores will be dropped and the two lowest team scores will be dropped from your grade calculation.

6.2 MasteringPhysics Exercises (MP Exercises) and MasteringPhysics Homework (MPHW)

In addition to the MPPCT (described in 5.3), there are sets of MasteringPhysics questions that *do* factor into your grade (MP Exercises). The online exercises on MasteringPhysics provide immediate feedback regarding whether you understand the concepts and how to do calculations. The questions on MP Exercises will typically be calculations and will usually not have hints. These assignments will be 8 - 10 questions and should take you 1 - 2 hours to do. MP Exercises will be due on **Fridays at 9:30 AM**. There is a specific page on Moodle on MasteringPhysics - please see it for more info. The MP Exercises make up 5% of your grade, and the lowest score will be dropped.

In order for you to practice problem solving and communicating your work, *one* question from each MP Exercise assignment will be turned in on Friday morning, referred to as the MP Homework (MPHW). I will clearly communicate which question is to be submitted and will post the grading rubric on Moodle. The MPHW make up 5% of your grade, and the lowest of these will be dropped.

6.3 Weekly Problems

The Weekly Problems will usually be more challenging than what you see on MasteringPhysics and will require you to analyze a real-world situation. You are encouraged to collaborate with each other and to seek help from myself and the course tutors. However, you are to submit your own written solution and will only receive full credit for clear and complete work. The grading rubric, and more information, is posted on Moodle.

6.4 Assessment

Every semester we administer a benchmark questionnaire at the beginning and end of the course, which will be delivered online. This allows us to evaluate the *course*, not the students.

In no way will it impact your grade, but we do ask that you do your best on both benchmarks. You need to complete the benchmark by Friday, August 25th. The deadline for the post-class assessment will be announced near the end of the class. Completing each assessment will be worth 1% of your grade.

6.5 Labs

Experimental work is an important component of physics. You will explore the concepts we cover in class through hands-on lab activities. The first day of lab will be Monday, August 28 or Tuesday, August 29 (depending on your section).

Your lab instructor is Hannah Clemmons. Her labs and my lecture are co-ordinated, but grading policies are independent. There is a separate Moodle page for pre-lab assignments.

6.6 CATME

"CATME" is a peer evaluation system that will be used for teammates to provide feedback to each other. This is completed online, and will be administered 4 times throughout the semester. 4% of your grade is for completing the assessment (including written feedback) and 8% is based on the evaluations you receive. See Moodle for more information - while fair, this is a complicated system.

7 Tests and Exams

7.1 Tests

There will be 3 in-class (50 minute) tests given during the semester. The tests will be closed book and closed note. In order for you to focus your time on problem solving, an equation sheet will be provided for all tests (and you can use a calculator). Tests will be similar to the MPHW and Weekly Problem (and similarly graded), with a focus on clear representations, problem solving, and communication.

If a test conflicts with a holiday that you observe, please let me know and we will find another day for you to take it. Due to the rhythm of the semester, you may end up with days with many tests. I am willing to let you take the test **early** (remember the honor code!), but it is not possible to take the test after the class has taken it.

The first test has a lower weight in your grade since it covers less material than the subsequent tests. It occurs early in the semester so that you can receive your grade on it before the Drop Day.

Test	Date	Content	Weight in Grade
Test 1	Fri, September 8	1D Motion	4%
Test 2	Wed, October 11	2D Motion and Forces	6%
Test 3	Fri, November 20	Energy, Momentum, Rotation, and Oscillation	6%

7.2 Final Exam

There will be a comprehensive final exam, including both material covered by previous tests and material beyond Test 3. An equation sheet will be provided, but otherwise it will be closed book and closed note.

8 Course Culture and Expectations

8.1 Inclusion

This course adheres to the principles of diversity and inclusion integral to the Agnes Scott community. We respect people from all backgrounds and recognize the differences among our students, including racial and ethnic identities, religious practices, and gender expressions. We strive for our campus to be a safe space in which all students feel acknowledged and supported and, at the same time, we understand that course content, critical inquiry, and classroom dialogues give us opportunities to examine topics from a variety of perspectives, a defining feature of a liberal arts education, and in the process compel debates that challenge beliefs and positions, sometimes causing discomfort, especially around issues related to personal identities. While we uphold and preserve the tenets of academic freedom, we request and invite your thoughtful and constructive feedback on ways that we can, as a community of learners, respectfully assist and challenge one another in our individual and collective academic work.

It is important to me that the examples and language we use in physics classes are welcoming to all students. I make efforts to avoid analogies based in sexist and heteronormative language, but you may find these when looking at online resources created by others. If you are comfortable doing providing it, I welcome feedback on how I can make my examples more relevant to students from diverse backgrounds.

Working in teams is meant to deepen everyone's learning, but some students may not feel that they are respected by or well-integrated into their teams. I will do my best to facilitate positive team experiences for all students, including providing structures and time for students to develop positive team interactions. Students are encouraged to reach-out to me if they do not see improvement in negative team interactions.

8.2 Title IX

If you have experienced any form of sexual harassment or violence, dating or domestic violence, or stalking, the college urges you to talk to any faculty of staff member with whom you feel comfortable. Faculty and staff members will support you and inform the college, and the college will respond to the problem through its defined procedures. Agnes Scott has supportive professionals in place to help stop, further prevent, and remedy misconduct that you have experienced. Incidents may also be reported directly to Title IX Coordinator Marti Fessenden (mfessenden@agnesscott.edu, 404-471-6547), Deputy Title IX Coordinator Karen Gilbert (kgilbert@agnesscott.edu, 404-471-6435)or Vice President for Student Affairs and Dean of Students Karen Goff (kgoff@agnesscott.edu, 404-471-6449). You should also feel free to talk to the psychologists or health care professionals in the Wellness Center, or the college chaplain, if you simply need support and do not want the college to initiate any further inquiry. Your discussions with these confidential resources remain confidential."

Marti Fessenden
Title IX Coordinator
mfessenden@agnesscott.edu
404-471-6547

Karen Gilbert
Deputy Title IX Coordinator
kgilbert@agnesscott.edu
404-471-6435

8.3 Academic Honesty

The Agnes Scott College honor code embodies an ideal of character, conduct, and citizenship, and is an important part of the College's mission and core identity. This applies especially to academic honesty and integrity. Passing off someone else's work as your own represents intellectual fraud and theft, and violates the core values of our academic community. To be honorable, you should understand not only what counts as academic dishonesty, but also how to avoid engaging in these practices. You should:

- review each course syllabus for the professor's expectations regarding course work and class attendance.
- attribute all ideas taken from other sources; this shows respect for other scholars. Plagiarism can include portraying another's work or ideas as your own, buying a paper online and turning it in as if it were your own work, or not citing or improperly citing references on a reference page or within the text of a paper.
- not falsify or create data and resources or alter a graded work without the prior consent of your professor. This includes making up a reference for a works cited page or making up statistics or facts for academic work.
- not allow another party to do your work/exam, or submit the same or similar work in more than one course without permission from the course instructors. Cheating also includes taking an exam for another person, looking on another person's exam for answers, using exams from previous classes without permission, or bringing and using unauthorized notes or resources (i.e., electronic, written, or otherwise) during an exam.

- not facilitate cheating, which can happen when you help another student complete a take home exam, give answers to an exam, talk about an exam with a student who has not taken it, or collaborate with others on work that is supposed to be completed independently.
- be truthful about the submission of work, which includes the time of submission and the place of submission (e.g., e-mail, online, in a mailbox, to an office, etc.).

You should understand that penalties result from dishonest conduct, ranging from failure of the assignment to expulsion from the college. You should speak with your professors if you need clarification about any of these policies.

The following behaviors are encouraged in Physics 202:

- Attempting a MasteringPhysics question or Weekly Problem and bringing your work to the tutor or professor for feedback on your understanding and approach.
- Discussing your approach to a Weekly Problem with your classmates and then listing their names as "resources".
- Studying with classmates before a test (or TBL quiz), including brainstorming what may appear as test/quiz questions.

The following actions are considered a **violation** of the honor code:

- Searching the internet for the text of a Weekly Problem or MasteringPhysics question to find the answer.
- Copying the work of a classmate on a Weekly Problem or MasteringPhysics question.
- Using allowed resources (the internet, other textbooks, friends) on Weekly Problems or MPHW, but *not listing* those resources.
- Utilizing solutions manuals for the textbook.
- Discussing any aspect of a test or the final exam with classmates before *everyone* has completed the test, including discussing how hard it was or how you feel you did.
- Discussing the TBL quiz, including how hard it was or general aspects, with someone who was sick and will be taking it later (or vice versa).
- Interacting with other teams during TBL, including listening to their conversations or looking at their scratchers.
- Using notes, solutions, or other materials from students who previously took the class.

Last updated August 21, 2017