

## Physics 101: Conceptual Physics Spring 2015 Syllabus

Instructor: Jessica Fielder  
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Office: Science 356  
Website: <http://www.physics.sfsu.edu/~jfielder/Phys101S15.html>  
Class Meets: MWF 10:10 AM – 11:00 AM, Science 201  
Office Hours: WF 2-4PM, T 10AM-1PM, or by appointment

### Required Materials:

1. Conceptual Physics, 12<sup>th</sup> Edition by Paul Hewitt.
2. You will also need to purchase access to Modified MasteringPhysics, the online homework system we will be using this semester. To login, you will need a reliable internet connection:
  - a. Go to [www.pearsonmylabandmastering.com](http://www.pearsonmylabandmastering.com)
  - b. Under Register, click the "Students" button. If you purchased an access card bundled with your textbook, enter the code in the card. If you bought a used book or a book that did not come with an access card, you can also purchase access directly from the registration page.
  - c. To join the course, you will need to enter your SFSU Student ID number and the **course ID: fielder39089**

**A note about the textbook:** You may purchase the textbook in whichever format you find most convenient (online, bound, loose-leaf, etc.). Typically, the cheapest option is to buy the e-text bundled with the Mastering Physics access code. You may also use an older edition of the book, as little material has changed in the past few editions.

**Prerequisites:** Knowledge of basic algebra and basic geometry (angles, right triangles, and circles). You must also have a score of 50 or better on the Entry Level Mathematics Exam (ELM), or a grade of C- or better in Math 70, or an acceptable ELM exemption.

**Laboratory:** The accompanying laboratory course, Physics 102, is optional. You might want to take it if you need a science lab course for GE requirements. Be sure to attend the first lab meeting to hold your place in lab (see schedule of classes for time and room locations).

**Course Objectives:** This class is an overview of conceptual physics for non-science majors. We will cover most of the material in the Hewitt textbook, following roughly the same order of topics. In addition to lecture, we will have in-class activities and short writing assignments, which are designed to help you learn collaboratively. We will use some basic algebra and geometry to solve problems, and a calculator is allowed on all exams. The overarching goals are for you to understand the nature of science through physics, understand the big ideas in physics, and develop a lifelong interest in science and current events surrounding physics.

## Important Dates (Please note exams!)

Feb 6:	Last day to drop without a W
Feb 20:	Last day to add by exception
<b>Feb 27:</b>	<b>FIRST MIDTERM</b>
Mar 20:	Last day to select CR/NC grading option
Mar 23-27:	Spring Break, no class
<b>Apr 1:</b>	<b>SECOND MIDTERM</b>
Apr 24:	Last day to withdraw* with a W
<b>May 1:</b>	<b>THIRD MIDTERM</b>
May 15:	Last class meeting
<b>May 22:</b>	<b>FINAL EXAM 8AM-10:30AM</b>

\*Physics & Astronomy Dept. Withdrawal policy: <http://www.physics.sfsu.edu/policy/withdrawal.pdf>

## Student Learning Outcomes

After successfully completing this course, students will be able to:

1. Explain the steps in the scientific method of inquiry, which involves gathering observable, empirical and measurable evidence subject to specific principles of reasoning, and recognizing that reproducible observation of a result is necessary for a theory to be accepted as valid by the scientific community
2. Analyze specific examples of how the scientific method has been used in the past to collect data through observation and experimentation, and to formulate, test and reformulate hypotheses about the physical universe; evaluate scientific information from a variety of sources and use that information to articulate well-reasoned responses to scientific concerns
3. Evaluate scientific information from a variety of sources and use that information to articulate well-reasoned responses to scientific concerns
4. Recognize the utility of alternative scientific hypotheses in the development of scientific theories, research and applications and understand how scientific evidence is used to develop hypotheses and theories
5. Describe ethical dilemmas arising out of contemporary scientific research and applications, which may include those related to social justice, and may have implications for local and/or global communities
6. Use scientific theories to explain phenomena observed in laboratory or field settings, and
7. Discuss the relevance of major scientific theories and research to their lives.

## Course Structure

Your grade will be determined based on your performance on in-class activities, homework assignments, and exams as described below in the grade policy.

In-class Activities: We will have weekly in-class activities, short small-group discussions, and short written responses to questions. These are designed to help you learn collaboratively and gauge your own level of understanding of the material. Written responses will be collected spontaneously once a week for participation credit. Each response is worth 1% of your total grade.

Homework: We will have homework assignments (about 1 per week) throughout the semester, and homework will contribute 30% of your overall grade. These will contain thought questions designed to help you synthesize information from the readings and lectures, and a few math-based problems. Every homework assignment has a firm due date, and late homework will be marked down 10% per day late. Homework submitted more than 10 days late will receive no credit. All problem sets must be done using the Mastering Physics system (see registration details above). In addition to the problem sets, there will be assigned reading from the textbook. It is recommended that you read the assigned sections at least once before lecture, as this will help the information presented in class make more sense.

Exams: There will be three in-class exams during the semester, each covering about one-third of the material. The lowest of these three exam scores will be dropped, and the remaining two exams will be worth 15% of your overall grade each. There will also be one cumulative final exam during finals week worth 25%, covering material from the entire semester (note that the final exam cannot be dropped, only one of the midterms). All exams will be closed book and closed notes, and will be a combination of multiple-choice conceptual questions and short-answer problems. Equation lists will be provided for you on the exams. You will need a #2 pencil and an 882-E Scantron form for each exam, and you are allowed a calculator. Exam dates are listed above in the "Important Dates" section, please take note and arrive on time. The final exam date is set by the University and is inflexible, but you may schedule to take a lecture exam earlier, with sufficient advance warning (at least two weeks). **There will be no make-up exams without prior arrangement. If you unexpectedly miss a midterm exam for reasons beyond your control, it will count as your one dropped exam.**

## Grade Policy

Grades are based on a combination of homework assignments, in-class participation, and exams with the weights shown below. I anticipate that letter grades will follow the scheme below, and reserve the option to lower the letter grade scale as the semester progresses.

Homework:	30%	A = 90-100%	CR = 60-100%
Participation:	15%	B = 75-89.9%	NC < 59.9%
Midterms (best 2):	30%	C = 60-74.9%	
Final Exam:	25%	D = 45-59.9%	
		F < 44.9%	

## Contacting Me

If you have questions about anything related to this class (or even physics in general), please don't hesitate to ask me. The best way to do this is in person, during office hours. Office hours are your chance to get one-on-one help from me, so use them as often as you can! If your question is short, I might have time to answer it outside office hours, or right before or after class, but I may ask you to come back if I am busy. If you would like to meet in person and are not free during the regular office hours, let me know so we can make an appointment. You can also contact me via email (see the first page for my email address). When emailing me, please include the words "Phys 101" somewhere in the subject line so my spam filter doesn't eat your message, and I know which class you are in. I will try my best to reply before the next class, but this is not always possible.

## Contacting Mastering Physics

If you have technical issues with the online homework system, see the Mastering Physics support page. They maintain FAQ pages, how-to videos, a searchable help database, and can provide assistance via phone, email, and online chat.

## Academic Integrity

SFSU maintains a firm policy on plagiarism and cheating, which can be found in the SFSU Bulletin. The Physics and Astronomy department also maintains a set of guidelines stating specific practices that are prohibited and the procedures for handling cases of academic cheating or plagiarism. This policy can be viewed online at:

<http://www.physics.sfsu.edu/policy/plagiarism.pdf>

## Disability Policy

Students with disabilities who need reasonable accommodations are encouraged to contact the instructor. The Disability Programs and Resource Center (DPRC) is available to facilitate the reasonable accommodations process. The DPRC is located in the Student Service Building and can be reached by telephone (voice/TTY 415-338-2472) or by email ([dprc@sfsu.edu](mailto:dprc@sfsu.edu)).

## Schedule (Subject to change)

Week	Lecture #	Date	Topics	Reading
1M	1	26-Jan	Introduction, Syllabus	
1W	2	28-Jan	Scientific Method, Units, Sig Figs	Chapter 1, Appedix A
1F	3	30-Jan	Inertia and Newton's First Law	Chapter 2
2M	4	2-Feb	Linear Motion	Chapter 3
2W	5	4-Feb	Mass, Weight, and Newton's 2nd Law	Chapter 4
2F	6	6-Feb	Newton's 2nd and 3rd Laws	Chapter 5
3M	7	9-Feb	Friction, Weight, and more Vectors	Chapter 6
3W	8	11-Feb	Momentum	Chapter 7
3F	9	13-Feb	Finish Momentum, Work and Power	Chapter 8
4M	10	16-Feb	Conservation of Energy	Chapter 8
4W	11	18-Feb	Rotational Motion	Chapter 9
4F	12	20-Feb	Rotational Motion	Chapter 10
5M	13	23-Feb	Gravity	Chapter 10
5W	14	25-Feb	Projectile Motion	Chapter 11
5F	15	27-Feb	<b>MIDTERM 1, in class (Covering Chapters 1-8)</b>	
6M	16	2-Mar	Atomic Structure	Chapter 12-13
6W	17	4-Mar	Density, Pressure, and Buoyancy	Chapter 14
6F	18	6-Mar	More Buoyancy & Pressure	Chapter 15
7M	19	9-Mar	Gas Pressure, Boyle's Law, Bernoulli's Principle	Chapter 16
7W	20	11-Mar	Temperature & Heat	Chapter 17

7F	21	13-Mar	Heat Transfer	Chapter 18
8M	22	16-Mar	Phase Changes & Thermodynamics	Chapter 20
8W	23	18-Mar	Vibrations and Waves	Chapter 21
8F	24	20-Mar	Sound	Chapter 22
9M	25	30-Mar	Catch-up day, Review	Chapter 22
9W	26	1-Apr	<b>MIDTERM 2, in class (Covering CH 9-21)</b>	Chapter 23
9F	27	3-Apr	Electric Charge, Coulomb's Law	
10M	28	6-Apr	Electric Fields, Electric Potential	
10W	29	8-Apr	Current and Voltage	Chapter 23
10F	30	10-Apr	Circuits	Chapter 24
11M	31	13-Apr	Magnetism	Chapter 25
11W	32	15-Apr	Magnetism Con't	Chapter 25
11F	33	17-Apr	Electromagnetic Induction	Chapter 26
12M	34	20-Apr	Light	Chapter 27
12W	35	22-Apr	Seeing and Color	Chapter 28
12F	36	24-Apr	Reflection and Refraction	Chapter 29
13M	37	27-Apr	Light Wave Properties	Chapter 30
13W	38	29-Apr	Interference and Polarization	Chapter 31
13F	39	1-May	<b>MIDTERM 3, in class (Covering CH 22-28)</b>	
14M	40	4-May	Light Emission	Chapter 32
14W	41	6-May	Quantum Physics	Chapter 33 & 34
14F	42	8-May	Nuclear Part 1	Chapter 35
15M	43	11-May	Nuclear Part 2	Chapter 36
15W	44	13-May	Special and General Relativity	
15F	45	15-May	Catch-up, review for Final Exam	
Finals		22-May	<b>FINAL EXAM, 8-10:30AM</b>	

## Physics 101 Student Contract

I understand that by enrolling in Professor Fielder's Physics 101 class I agree to the following:

1. **Show up.** I promise to attend every lecture (except in case of a dire emergency) and realize that my chances of obtaining a good grade are significantly lower if I miss lectures.

2. **Respect other students.** I understand that questions are welcome at any time throughout the course, and time will be provided for discussion of the subject materials among students. However, off-topic discussions between students are disruptive, and students who repeatedly engage in off-topic discussions will be asked to leave the lecture hall.

3. **Keep it distraction-free.** I understand that phones, media players, laptop computers, and other electronic devices must not be used during the lecture, unless required to support a disability. Students who use such devices without permission will be asked to put them away. Simple pocket calculators are exempt from this requirement, and may be used at all times.

4. **Homework is online only.** I understand that an internet connection is required to do the homework assignments. It is my responsibility to make sure that I have sufficient internet access to complete the homework assignments. If I plan to use SF State's public computer rooms, I understand that waiting times to use the public computers can be very long during peak hours, and that this cannot be used as an excuse for late homework.

5. **Have a good Internet browser.** If I plan to use my personal computer to do the homework assignments, I understand that a relatively up-to-date, flash-enabled browser (Internet Explorer 7 or later, Mozilla Firefox 3 or later, or Apple Safari 3 or later) is required.

6. **Personal computers need care.** I understand that viruses, malware, dropped internet connections, and certain browser add-ons (such as Adblock or Flashblock) may interfere with my access to the online component of this course. These and similar errors are not the responsibility of Ms. Fielder and may be resolved by contacting the SFSU computer help desk, or the Mastering Physics support team. Unless the errors affect everyone in the course, they do not constitute a valid excuse for late homework or other missed assignments.

7. **Email needs to be checked.** I have a functioning email address and will check my email at least weekly for course updates from Ms. Fielder. When writing to Ms. Fielder, I will put "Phys 101" in the subject of my email, and include my full name in the email. I realize that certain email providers, such as AOL, can block emails with attachments, or have overly aggressive spam filters (such as whitelists). It is my responsibility to configure these unreasonable spam prevention features so that I do not miss critical emails from Ms. Fielder or other SFSU faculty and staff.

Student Signature: \_\_\_\_\_

Date: \_\_\_\_\_