

Course Outline: Physics 100: General Physics 2014-15

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1 Contact Information & Office Hours

1. First Term: Carl Adams, Rm 1006 Physical Sciences Complex, 902 867-5337, in research lab PS 1070, or in undergrad labs 1012 or 1067. Email: cadams@stfx.ca. I am usually teaching, in my office, or lab from 9 to 5 each day with the possible exception of Tuesdays and Fridays. Formal office hours are
 - Monday 9:15-11:05
 - Wednesday 10:15-11:05 and 1:15-2:05
 - Thursday 10:15-12:05
2. Second Term: Brandon van Zyl PS1019, 902 867-3944, bvanzyl@stfx.ca. Office hours TBA.
3. The labs will be operated for the entire year by Senior Lab Instructor Jamie Powell, PSC 1017, 902 867-2302, jpowell@stfx.ca.

2 Communication

We will be using multiple communication methods. “Notices” should come to your email account but they may come directly from one of us, from Moodle, or from MasteringPhysics. Most of the course resources will be found on Moodle (including Lab Resources) but there may be some on the course website <http://www.stfx.ca/people/cadams/physics100> (e.g. previous tests are found through the course website).

3 Course Resources

The textbook is *College Physics: A strategic approach* 3rd edition **with** *MasteringPhysics*TM by Knight, Jones, and Field. You do not need the paperback Student Workbooks. (These were used in previous years.)

“MasteringPhysics” is an on-line system for assignments which you are required to use. Be warned: if you are buying a used copy of the book and tutorial books which *will not* include access to MasteringPhysics. You will need to purchase access separately for \$60!

The course ID for *MasteringPhysics*TM is MPADAMS84823. You will be prompted for this when you first access the PHYS 100 assignments through MasteringPhysics.

The 2nd edition has been used for the past 3 years. They are quite close in content but the assignment and tutorial questions will refer the 3rd edition. We will also refer to sections in the 3rd edition in class and review sessions.

4 Topics

We will roughly cover Chapters 1-11 first term (one chapter per week). In first term the topics more or less follow each other and build up slowly. There is a breakdown of the sections on the Moodle site. In 2nd term: Chapters 12-16, parts of Chapters 17,18, 20-25, and 28-29. Compared to first term there is a wide variety of topics, some of which are more or less independent. We have roughly 70 classes.

The order of topics will be:

1. First Term

- (a) Force and Motion (Ch. 1-8)
- (b) Conservation Laws (Ch. 9-10)
- (c) Thermodynamics (Using Energy) (Ch. 11)

2. Second Term

- (a) Thermodynamics (Ideal Gases) (Ch. 12)
- (b) Fluids (Ch. 13)
- (c) Oscillations and Waves (Ch. 14-16)
- (d) Optics (parts of Ch. 17-18)
- (e) Electricity and Magnetism (most of Ch. 20-25)

5 Grading Scheme/Midterm Schedule

A grade will be sent to the registrar at 3 points in the course: 1st term “midterm”, Christmas, and final. Assuming that lab, tutorial, and class attendance are satisfactory the final grade will be determined as follows:

April Exam	25%
Christmas Exam	25%
Oct. 22 Midterm	12.5%
Feb. Midterm (Date TBA)	12.5%
Mastering Phys. Assignments (4 per term)	10%
Labs	15%

1. If you “fail” the laboratory section you will fail the course regardless of your grades in the other aspects (maximum grade 40% would be applied to Christmas and final grades.) However a failing grade in the lab is not simply a grade less than 50%. See the details in the lab description “General Information” on the Moodle site.
2. The grade is evenly distributed between the terms and evenly through the term (i.e. you can’t leave everything until the end *but* you will have more certainty going into the final exam.)
3. The last day to drop a full year course is Jan. 12, 2015.
4. The April exam and February midterm will cover 2nd term material.

5. Exams and midterms will be closed book but we will provide a formula sheet. You will have access to the sheet prior to the tests.
6. There will be lab exams 1st and 2nd term that will take place on your usual lab afternoon.
7. We don't have any control over the exam schedule. Do not schedule any plane flights that cause you to miss exams!
8. At our discretion we may adjust the class marks upward on an exam or midterm to bring them in-line with academic norms ("scaling the marks").
9. At our discretion we may round up part marks for the individual grades you receive. If the final mark is "close" to a multiple of 10 we may add up to 1.2 marks. We may add up to 2 marks to bring your final up to 50%. But that is it. We will look over your marks to check and see if a mistake was made but we don't just "add marks" because you ask us to (aside from the above cases). There is a formal appeal policy (Section 3.13 of the Academic Calendar) if you would like to appeal your final grade. We don't do this to be mean or take away your scholarship but to respect the integrity of all of the grades assigned.
10. The midterm grade will be 80% midterm exam and 20% MasteringPhysicsTM completed by Mon., Oct. 27, 2014. The Christmas grade will be 50% Christmas exam, 25% midterm, 15% lab Christmas grade, and 10% MasteringPhysicsTM Assignments from 1st term.

6 Labs and Tutorials

Labs and tutorials begin on Sept. 10. Prior to this you will be split into an "A" group and a "B" group. The Wednesday A group will attend lab on Sept. 10 in PS 1012 and the Wednesday B group will attend tutorial in PS 3046. Next week (Sept. 17), the A group can go directly to tutorial in PS 3046 and the B group goes directly to lab. The same thing will happen on Sept. 11 for those of you who have signed up Thursday lab. There is flexibility to juggle between the groups if you need to.

Labs will be in the Physical Sciences Complex in the Physics Teaching lab 1012 and 1012.1. Jamie Powell is the Senior Lab Instructor and is in charge of the labs (marking, due dates, extensions, absences etc.). Policies are detailed in the *General Laboratory Information* document. Information and documents pertaining to labs are on Moodle.

Students MUST attend ALL lab sessions.

Your student account will be charged \$10 for lab fees to offset the cost of lab materials.

Tutorials are in PSC 3046. They are **mandatory**. The Dean's office will be informed if students miss tutorials and appropriate penalties will be applied. Bring your textbook and a calculator to the tutorials.

7 Course Policies

1. For all members of our class to learn effectively, this classroom must be a safe learning environment. To ensure safety for all students, the policy in this class is that no one shall be discriminated against or harassed. For more information on St. Francis Xavier University Discrimination & Harassment Policy, please contact Marie Brunelle, the Human Rights and Equity Advisor (mbrunell@stfx.ca) or go on line <http://www.mystfx.ca/campus/stu%2Dserv/equity/>

2. I refer your attention to Section 3.8 of the Academic Calendar Academic Integrity Policy. These codes and policies extend to material and data in the laboratory as well as exams, midterms, and assignments.
3. I also refer your attention to Section 3.7 which deals with classroom attendance.
4. There will be no extensions for MasteringPhysics assignments except through a legitimate excuse (medical, personal, etc) approved by the Dean's office (902 867-3909, sites.stfx.ca/dean_of_science).
5. If your tutorial attendance is satisfactory the lowest assignment grade will be dropped.

8 Goals and Methods

It is our intention that upon successful completion of this course you will have become familiar with a large number of physical phenomena, have learned how you use theories/models to describe these phenomena, and that you have developed techniques and skills for solving problems that involve physics. **This is what you will be tested on.** (We also hope you will have increased your scientific literacy but you will not be tested directly on this.) Part of the testing will involve “find the formula, fill it in” or “plug and chug” but it is not our intention that this be the major portion of the tests and exams. (Knight has a long discussion about this on page xi.)

To achieve these goals we will use a traditional lecture format and a variety of classroom demonstrations. Physics education research has demonstrated the viability of spending time on conceptual questions before directly charging into formulas. Reading ahead (particularly if you have never taken physics before) will help you prepare for the lectures.

How hard is this course? Dr. Adams has taught this course for the past 3 years and the average is 72% and the “XDIFF” is around -3%. (so if you look at the averages of all the students excluding this course the average grade in PHYS 100 is about 3 percentage points lower). The drop/failure rate is about 15%. So it is probably one of the harder courses that you take but it is well within the grade range for first year science courses.

How much work will this course take? It really depends on the individual. If you are a physics “natural” and have seen the topics in high school you might find it very straightforward and spend less than 30 minutes per week outside of class, labs, and tutorials preparing for lectures, reviewing, and working on assignments (well, for the 1st 10 weeks). If however, you struggle with trig, algebra, diagrams, graphs, and abstract reasoning you will need to build up these skills (maybe 3 hours per week, try the pretest). A lot of this is just practice and judicious use of “why?”.

Why do students struggle? In Dr. Adams' opinion there are two main reasons. One of them is in your control: making the university (through the Dean's office) aware of your health and well-being. Every year after a midterm or exam a student will come to me (Carl) and say “I was sick when I wrote that.”, “I was upset when I wrote that.”, or “I haven't been coming to class/haven't been able to study because of (...)”. We can't do anything after the fact! Let the Dean's office know and we can all work together for a reasonable solution. But if you are sick and can't write the exam... don't come to the exam!

The second reason is that students, when they realize they are struggling, take the wrong approach. They feel that by “seeing” the problems several times they will learn how to do them. Certainly it makes sense to try key problems a few times but you must engage your thought process. Why are you doing the steps you are doing? Don't cheat on your MasteringPhysics assignments! If you start a problem on your own after seeing it several times and you say “I have no idea how

to start” you are taking the wrong approach. Ask questions during class, after class, during office hours and by email, pay attention in class, read the text, start assignments early, work through examples in the text and topic questions that we haven’t gone through. There will be optional tutorials prior to the midterms and exams to review and highlight the materials that we think are important. Also keep in mind that we keep building on material that is introduced earlier in the course e.g. you can’t just say “forget about vectors; I’ll concentrate on other things”.