

Franklin & Marshall College - Physics and Astronomy Department
Physics 111: Fundamental Physics I (Section A)
F. Crawford
Spring 2015 Course Information

Welcome to the Spring 2015 edition of Physics 111: Fundamental Physics I. This is the first part of the year-long sequence of a general survey and introduction to physics. We will cover a number of topics this semester which are outlined in more detail in the Course Schedule. Physics, the most fundamental science, is a challenging subject, but is also very satisfying once mastered. A surprising amount of our everyday experience with the physical world can be understood precisely with the use of only a few fundamental principles that we will cover in this course. In addition, these principles provide a fundamental understanding of the behavior of the universe in situations far beyond our common experience. We depend on your willingness to invest significant effort in order to master the ideas. However, we will do everything in our power to teach you efficiently and to reveal the fun side of physics.

The web page for this section is: http://venus.fandm.edu/~fcrawfor/teaching_spring_2015_p111.html
Assignments and announcements will be posted here, so you must check it regularly.

Location and Times

- **Lectures:** MWF 10:00 - 10:50 a.m. in Hackman 218. It is essential that you come to all classes (and participate!) to master the concepts and material in this course. All absences, for any reason (including illness, athletic events, etc.) should be discussed *in advance* with the instructor. Excessive absences can have a significant (negative) impact on your grade.
- **Labs:** Mon, Tue, Wed, or Thu (depending on your lab section) 1:30 - 4:20 p.m. in Hackman 229. You may not switch lab sections without approval, since we need to keep the sections approximately equal in size for logistical reasons. A lab information sheet will have more details about the labs. The lab meets every week (except where noted). Concepts investigated in the laboratory sessions will be included in the examinations. Labs begin the week of Mon Jan 19. The labs are an important component of this class, so you are expected to attend all laboratory sessions. If you have an unavoidable absence, you must consult with your lab instructor to either attend one of the other lab sessions the same week (which may not be possible with the enrollments!) or come to some sort of other arrangement. Note that *the lab portion of the course must be completed satisfactorily in order to pass the course.*

Instructions for the laboratory experiments are available at: <http://physicsdb.fandm.edu>. Enter the database and search or browse for the lab experiment of interest. Note that the web page in the database for a given lab is just a general description; the detailed instructions/hand-outs are in a downloadable PDF file on that page.

Occasionally there will be a short quiz at the start of the lab which covers the material covered in lecture the previous week (see below).

- **Physics Tutoring Clinic:** An optional Physics Clinic staffed by a physics major will run on each Sunday evening from 7:00 to 10:00 p.m. in the physics lounge (Hackman 215). The TA is there to assist students specifically enrolled in our PHY 111 section. This is a valuable resource for clearing up confusing issues from class and for getting help with the homework assignments. We urge you to make use of this dedicated TA. We will announce in class who the TA is once we have settled on that.

Textbooks and Supplies

- *Physics for Scientists and Engineers* (4th edition) by Giancoli. I find this book quite readable and clear as far as physics textbooks go. In this course we will only cover "Volume 1" (which contains Chapters 1 through 20), so it is not necessary to purchase the full version of the book which has both volumes.
- You must purchase a ruled laboratory notebook for the lab (available in the bookstore, for instance).
- The labs will be available for download each week from the lab database (so, you will not need to buy these, but you will need to bring the lab handout to lab each week).
- A pocket scientific calculator will be needed for problem sets and tests and in the laboratory.

Assignments and Tests

- Written work will be assigned weekly and will be collected. A random subset of the assigned problems will be graded each week. Each problem will be graded out of 2 points, with 2 points for a complete and correct answer, 1 point for a solid attempt at the problem, and 0 points for minimal or no effort on the problem.
- There will also be assigned reading before each class to prepare you for class discussion. These readings are listed on the course schedule.
- Occasionally (roughly every other week) there will be a short quiz at the start of the lab which covers the material covered in lecture the previous week. These will be graded by me and will be folded into the homework grade.
- There will be two exams during the course of the semester (see the course schedule for the dates) plus a final exam scheduled by the registrar.

Instructors

Lectures:	Fronefield Crawford
Office/Phone/Email:	Hackman 200 / (717) 358-4499 / fcrawfor@fandm.edu
Mon Lab (Section A):	Calvin Stubbins
Office/Phone/Email:	Hackman 210 / (717) 291-3812 / cstubbin@fandm.edu
Tue Lab (Section B):	Kassie Martin-Wells
Office/Phone/Email:	Hackman 211 / (717) 358-4527 / kmartinw@fandm.edu
Wed Lab (Section C):	Calvin Stubbins
Office/Phone/Email:	Hackman 210 / (717) 291-3812 / cstubbin@fandm.edu
Thu Lab (Section D):	Ned Dixon
Office/Phone/Email:	Hackman 227 / (717) 358-4812 / ndixon@fandm.edu

Office hours will be announced shortly after the start of the course.

Please do not hesitate to contact us; no question or topic is too small. If you are having a lot of trouble with the homework, be sure to come to see one of us as *soon* as possible. A good way to get together is to arrange a mutually agreeable time with us, either by email or in person after class. We expect you to read your email and check the web page regularly as we will make announcements and answer some questions in this way. You should feel free to send us email when you have a question or comment.

Feedback: We are always interested in feedback. If you have concerns about the course or ideas about how to make it better, you should let us know immediately, either in person or by e-mail. Don't wait!

Grading

Exam #1	20%
Exam #2	20%
Final Exam	25%
Laboratory	15% (<i>Note: you must pass the lab to pass the course!</i>)
Homework Assignments & Lab Quizzes	15%
Participation & Effort	5%

Note that the participation grade is based on your questions and comments (either in class or after class), your attendance, and your demonstrated effort to do the best you can in the class.

Grades will be "curved" in the following sense. At the end of the semester, I will compute the overall final grade (out of 100) for each student, based on the above formula. Then I will map these scores onto a letter scale which translates these percentages into letter grades.

Late Policies

- Late homework assignments will not be accepted, but your lowest homework score will be dropped at the end of the semester.
- Labs must be done on the scheduled date unless cleared in advance by the lab instructors. Individual experiments are not kept set up after the week in which they are used.
- Exams must be taken during the stated times, except by prior agreement. You may get an extension on an examination ONLY with a Dean's excuse.

Cheating, Plagiarism, etc.

Trust between the instructors and students is important for the integrity it fosters and the pedagogical flexibility it affords. It is one of the bedrocks of a quality learning experience. The important guiding principle of academic honesty is that you must never represent the work of others as your own. You may seek assistance from the instructors, from the TA, or from your fellow students in doing the weekly assigned exercises and preparing for class discussions. You may also work together with other members of the class on these assignments, and this is often quite beneficial. For your own good, avoid situations in which you are either contributing either too much or too little to such collaborations. Just copying someone else's work is clearly a representation of another student's work as your own and is a violation. Detailed instructions will be given on the exams themselves and discussed in advance. You must use only those materials allowed in the instructions given on the exam. No collaboration of any sort is allowed once you start an exam. The allowed time must be strictly observed. In short, please don't cheat. It's not worth it, and, believe it or not, it is surprisingly easy to spot. Please come talk to us or request clarification if you find yourself in any doubtful situations.

Advice

This is designed to be a challenging course!

You may need to improve your study habits in order to do well in this course. The following suggestions are based on the experience of previous students:

- *Review* your class notes between lectures, and come prepared to ask questions. Annotate your class notes as you read them. When you take notes in class, *don't just write down equations!* Qualitative information is often essential!
- *Stay up to date* on the reading; preferably read the assigned material twice; for example, once before the relevant lecture, and once after.
- *Read with pen in hand* to work out things described only briefly in the text or lecture. Ask yourself what is the main point of each section, and answer the question. Highlighting the text as you read is no substitute for this exercise in thinking and reinterpreting what you have read!
- *Make drawings* of the physical situations we discuss in class or the ones you encounter in problem sets (and real life!). This helps you understand just what is going on much more than merely thinking about it.
- Don't spend more than one hour on a single homework problem. Show clearly where you're stumped and just move on. Don't feel badly if this happens occasionally, or worry about the effect on your grade. Consistency in doing the homework is more important.
- Try the homework problems first yourself, but do get help in clinic or during office hours if you need it. That's why these resources are provided. We expect you will make use of them as one more learning tool.
- You need to allocate a significant amount of time for study and homework each week (plus class time and lab responsibilities). This isn't merely a time budget. It is also what is needed to allow the ideas and methodology to really sink in so that you have truly mastered the subjects.
- Do stop in to see one of us if you have questions or suggestions.

- When you are studying for an exam, *first* perform new problems and redo as many old problems as you have time for. Only after you have done so is it a good idea to *then* review the *solutions* to problems and previous exams. You always learn more from engaging in problem-solving than reviewing how someone else (even yourself in a previous week!) solved a problem.
- Study for the exams *in advance*. Your brain tackles problems differently if you have given it time to mull over new material and new approaches to problem-solving. You really think differently (and better) once you have literally slept on new ideas.
- Remember that if the material is new or unfamiliar for you, learning will take time, just as learning a new language takes time. Try not to become discouraged if the going is rough at times, and don't prejudge your ability to master the material. Generations of students have done it before you. There is no magic method of presenting the material that we can use to make it easy.