

Franklin & Marshall College - Physics and Astronomy Department
Astronomy 121: Introduction to Astrophysics
F. Crawford
Spring 2013 General Course Information and Policies

Welcome

Welcome to the Spring 2013 edition of Astronomy 121: Introduction to Astrophysics. This course presents an introduction to the basic physical concepts that underlie astronomy and astrophysics and as such uses some physics and math to illustrate these concepts. This course is an appropriate gateway to higher-level courses in physics and astronomy which build upon the concepts that are introduced here. Thus, this course is appropriate for potential majors in physics and astrophysics (and other science majors) who are interested in going further in the field.

The co-requisite for the course is MAT109 (derivative calculus). However, the development of basic physical concepts as they relate to understanding the detection and workings of astronomical objects and phenomena will be an important part of the course. Therefore, it is helpful if you have had some exposure to introductory physics (e.g., mechanics) and you should be quite comfortable with algebra, trigonometry, vectors, and scientific notation. In general, most of the necessary physics can be quickly reviewed in class if needed before we apply it to astrophysical problems. Thus, any students with limited physics and math who are willing to work a bit harder and do extra work to get up to speed and stay on top of things should be able to handle the material. If you are in doubt about your physics and/or math background, please come talk to me and we can discuss it.

The web page for the course is http://venus.fandm.edu/~fcrawfor/teaching_spring_2013_a121.html. Assignments and announcements will be posted here, so you must check it regularly.

Class Meetings

- The class meets MWF 11:00-11:50 a.m. in Kaufman 204.
- Since some of the material we will be discussing in class will supplement the reading, and since I occasionally will present material in a different manner than the book, class attendance and participation is required for each meeting. It will be very difficult to be successful in this course if you do not show up! All absences, for any reason (including illness, athletic events, etc.) should be discussed *in advance* with the instructor.
- Also, please leave the laptops at home – you won't need them while you are in class (if you plan to actually take notes with a laptop, please come talk to me individually about it). Also, please lay off the texting and phone calls during class since it is pretty distracting (even if you think nobody can notice it).

Instructor

Instructor: Froney Crawford
Office: Hackman 421
Phone: (717) 358-4499
Email: fcrawfor@fandm.edu
Office Hours: Tue 2-4 p.m., Wed 4-5 p.m. (or just drop by)

Please, let's all use first names. Call me Froney.

Come see me anytime! I am always happy to talk (except right before class, when I am usually busy getting ready). Official office hours are listed above, but you can come by anytime. Please do not hesitate to contact me; no question or topic is too small. If you are having a lot of trouble with the work, be sure to come to see me as *soon* as possible. You should feel free to send me email when you have a question or comment. If you have concerns about the course or ideas about how to make it better, you should let me know immediately, either in person or by email. Don't wait!

Labs

- Labs will also be taught by Froney Crawford and will meet weekly on Wed from 7:30-9:20 p.m., usually in Hackman 425. Occasionally we will meet elsewhere, and I will let you know in advance (probably by email or in Wednesday's class) which lab we will be doing in a given week and where we will meet. I'll have more to say to you in person about lab logistics and policies, including what needs to be turned in to be graded and when it is due. Our first lab meeting will be on Wed Jan 23 (i.e., the second week of class).
- Note that it is very important that you come to all the labs since these are group work sessions and the lab setups cannot be easily maintained for makeup labs later. The labs are an important component of the source and a passing grade is required in lab in order to pass the course.

Astronomy Clinic

- An optional Astronomy Clinic staffed by experienced and friendly astro majors will run weekly on Sunday evenings from 7:00-10:00 p.m. in the astronomy seminar room (Hackman 420). This clinic is a valuable resource for clearing up confusing issues from class and for getting help with the homework. I encourage you to use this resource!

Textbooks and Supplies

- *Foundations of Astrophysics* by Ryden and Peterson is the required textbook.
- The Astronomy 171 Lab Manual from the bookstore.
- A scientific calculator.

Assignments and Tests

- Written work will be assigned weekly and is due at the specified time and date. Each homework problem (or subset of a problem for those problems with multiple parts) will be graded out of 2 points, with 2 points for a correct answer with supporting work, 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 each week to prepare you for class discussion (do these readings in advance). These readings are listed on the course schedule.
- There will be one hour exam and a final exam. See the course schedule for more details.

Grading

A breakdown of the grading is as follows:

Hour Exam	25%
Final Exam	25%
Written Assignments	25%
Laboratory	20%
Participation/Effort	5%

- Note that the participation grade is based on your questions and comments (either in class or after class), your attendance record, 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 that translate these percentages into letter grades.
- **Note that you must have a passing grade in every area of the course in order to pass the course.**

Late Policies

- Labs are expected to be done during the lab time on the week they are scheduled, and late labs will not be accepted without prior arrangement.
- Late homework will not be accepted since I will provide solutions soon after the homework is due. Plan ahead!
- Exams must not be taken or turned in later than the stated times, except by prior agreement. You may get an extension on an examination **ONLY** with an excuse from the Dean's office.

Academic Misconduct

The important guiding principle of academic honesty is that you must never represent the work of others as your own. Cheating and plagiarism are very serious offenses that can have dire consequences. The following guidelines should govern your behavior in the course; please request clarification if you find yourself in any doubtful situations.

- You may seek assistance from the instructor, the Astronomy Clinic, or your fellow students in doing the weekly assigned exercises, group work, and preparing for class discussions. You may also work together with other members of the class on these assignments (unless specified otherwise), 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.* This applies to copying down results worked out on a blackboard by other students as well as solutions written down on paper. Please be cautious about loaning your work to others, since this can also lead to problems for both parties.
- Exams must be entirely your own work. 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.

Even though F&M does not have an official honor code, some elements of an honor code can have quite a positive impact on the classroom setting. This goes beyond just the obvious "no cheating" policy (see above). You are an important participant in this educational journey, and as such you deserve to be trusted and to have a significant share of the freedom and responsibility that comes with that trust. From my previous experience as an instructor both at F&M and elsewhere, I know that when students accept this it can lead to a more rewarding and vibrant learning experience for everybody. Please consider yourself invited to engage with me and the class as an equal, and please don't be timid about speaking your mind (respectfully). You'll get the most out of the class if you adopt this attitude and approach with me and make yourself comfortable in this class.

Advice

This is designed to be a challenging course!

You will need good study habits and a sustained weekly effort over the course of the semester in order to do well in this course. If you fall behind, things can rapidly deteriorate. The following suggestions are based on the experience of previous students:

- *Review* your class notes between meetings, 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 class, and once after.
- *Ask questions* in class if things do not make sense or are unclear. Don't let the opportunity go by because you will be even more lost later if you don't resolve any confusion early.

- *Read with pen in hand* to work out things described only briefly in the text or class. 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 assignments (and real life!). This helps you understand just what is going on much more than merely thinking about it.
- Don't spend an excessive amount of time (a few hours?) on a single homework problem. Show clearly where you're stumped and just move on. Don't feel bad 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. I'll expect you will make use of them as one more learning tool.
- Do stop in to see me if you have questions or suggestions.
- 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.