

Franklin & Marshall College - Physics and Astronomy Department
Astronomy 121: Introduction to Astrophysics
F. Crawford
Spring 2015 General Course Information and Policies

Welcome

Welcome to the Spring 2015 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_2015_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.
- Because of the workshop nature of the course and the group work we will be doing, class attendance and participation is required for each meeting. 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 220
Phone: (717) 358-4499
Email: fcrawfor@fandm.edu
Office Hours: TBA

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 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 and graded and when it is due. Our first lab meeting will be on Wed Jan 21 (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 course and a passing grade is required in lab in order to pass the course.

Astronomy Clinic

- An optional Astronomy Clinic staffed by an experienced and friendly astro major will run weekly on Sunday evenings from 7:00-10:00 p.m. (location TBD). This clinic is a valuable resource for clearing up confusing issues from class and for getting help with the homework before it is due. I encourage you to use this resource!

Textbooks and Supplies

- *Quantitative Astronomy* by Thomas L. Swihart is the required textbook.
- The Astronomy 121 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.
- We will be doing group work in class, and this will form a significant part of your participation grade. This group work is explained in more detail in the weekly class plan.
- There will also be assigned reading each week to prepare you for class discussion and group work (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	20%
Final Exam	20%
Laboratory	20%
Written Assignments	20%
Participation, Group Work, & Effort	20%

- Note that the participation grade is based on your questions and comments (either in class or after class), your attendance record, your demonstrated effort to do the best you can in the class, your participation in the group work, and your class presentations.
- 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 (more than an hour?) 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.