

General Course Information and Policies

Astronomy 205a: Introduction to Astrophysics I
Haverford College - Astronomy Department

Fall 2003
F. Crawford

Welcome to the Fall 2003 edition of *Astronomy 205: Introduction to Astrophysics I*. This is the first half of a two-semester sequence (Astro 205 and 206) required for astronomy majors. The first semester is devoted to the study of stars, the premier residence of the universe, and our own Milky Way galaxy (referred to as the Galaxy with a capital G). An important component of the latter is the interstellar medium (ISM), which consists of everything that lies between the stars in the Galaxy. Although it only comprises about 10% of the mass of the disk of the Milky Way, the ISM provides the material out of which new stars are born and is the recipient of processed matter that stars shed during their lives. From the study of the ISM, it is possible to deduce a great deal about the history (including the formation) of the Galaxy. Together with Astro 206 (extragalactic astronomy, cosmology, and the solar system), this course will provide a broad introduction to astronomy and astrophysics and serves as a prerequisite for the study of advanced topics. About 2/3 of the course will be devoted to the study of stars and the remaining 1/3 to the ISM and Galaxy. Another goal of Astro 205 is to provide an introduction to observational astronomy. This goal will be addressed by completing 3 observing projects at the rate of about one every 4 weeks. These will require some additional instruction in the use of the telescopes and cameras during the first few weeks of class (see below).

Lectures: Tue and Thu 8:30 - 10:00 a.m. in the Observatory.

All absences from class, for any reason (including illness, athletic events, etc.) should be discussed *in advance* with the instructor. Excessive absences can result in a grade of "Incomplete".

Workshops/Discussions: A one-hour, weekly workshop/class will be scheduled. The first few of these will be workshops on telescope use. The remaining will be problem/discussion sessions and project report workshops.

Observing Projects: Three observing projects will be assigned during the term. Written reports will be required for projects #2 and #3. The first project, on astrophotography, will begin the second week of class. Students will work in teams of three at the telescope. After completing project #1, students are allowed to sign up for independent use of the telescope as long as they are accompanied by another qualified observer. **WARNING:** The weather is a formidable foe. Even though the actual number of hours you spend observing will be few, you will have to be "on call" for much of the semester. You must be willing to give observing top priority on clear evenings. Otherwise, you won't be able to complete this part of the course.

1. **Astrophotography** (with the 12" Schmidt-Cassegrain): Students will take images with photographic film of several astronomical objects (e.g., the Moon, planets, a gaseous nebula, a galaxy, etc.)
2. **Sun:** A solar telescope will be used to measure solar limb darkening. An analysis of these data will enable you to deduce the temperature gradient at the surface (photosphere) of the sun. In addition, observations of the apparent movement of sunspots will be used to determine the sun's rotation rate.
3. **Stellar Photometry:** B and V band photoelectric photometry will be used to measure the light curve of a Cepheid variable. An analysis of these data will enable you to estimate the luminosity of and the distance to the star.

Observatory Keys: In order to have access to the library and the telescopes after hours, it will be convenient for you to have a key to the Observatory. Take the signed Key Request Form to the Haverford Security office. They will tell you when your key will be ready. There is often a considerable time lag between turning in the application and receiving your key, so deal with this right away.

Instructor Contact Information:

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Come see me anytime; no question or topic is too small. If you are having a lot of trouble, be sure to come to see me as *soon* as possible. I expect you to read your email and check the web page as I will send announcements and answer some questions in this way. You should feel free to send me email when you have a question or comment.

Textbook: *Astronomy: A Physical Perspective* (2nd edition) by Marc L. Kutner (required). Several other introductory astronomy and physics textbooks will be placed on reserve in the Observatory library, and, of course, the library is filled with books on the subject. Don't hesitate to use them, particularly if you find a particular section of your text hard to follow. Occasionally, readings from the reserve texts may be assigned.

Homework: Written homework assignments will be due roughly every two weeks. Collaboration on homework is encouraged except on those problems where it is explicitly forbidden. Homework turned in late will be given up to 50% credit if turned in up to one week late, and up to 25% credit thereafter. Homework solutions will be provided after the due date.

Exams: There will be one in-class midterm exam (covering roughly the first half of the course) plus a self-scheduled final exam (covering roughly the second half of the course). You may get an extension on an examination **ONLY** with a Dean's excuse.

Grading: The grade for the course will be computed according to the following percentages:

Midterm Exam	20%
Final Exam	20%
Observing Projects	25%
Homework	30%
Participation and Attendance	5%

Honor Code Matters: We value Haverford's honor code for the integrity it fosters and the pedagogical flexibility it affords. The important guiding principle of academic honesty is that you must never represent the work of others as your own. Please request clarification if you find yourself in any doubtful situations.