

ASTR 008/PHY 008 – Introduction to Astronomy Lab
Spring 2013
LL 221

Instructors:

Prof. Ginny McSwain
office: LL 405
email: mcswain@lehigh.edu
phone: 8-5322

TA: Kebra Ward
office: LL 307
email: kaw310@lehigh.edu
phone: 8-5140

Course Objectives:

Students will gain experience applying astronomical observations of the Solar System, stars, the Milky Way Galaxy, and other galaxies to understand the Universe.

This one-credit laboratory is designed to accompany the three-credit course ASTR/PHY 007, Introduction to Astronomy. Although the course (007) can be taken without the laboratory (008), the reverse is not permitted. Students registered for ASTR/PHY 008 must be enrolled concurrently in ASTR/PHY 007.

Required Materials:

Introduction to Astronomy Laboratory Manual

Laboratory Notebook: Roaring Springs Lab Notebook 77-648 (located in the Bookstore by the course textbook, and also in the general supply area and by the checkout counters)

Ruler (about 30 centimeters, preferably clear plastic)

Basic Scientific Calculator (should have sin, cos, ... functions)

The Miller Planisphere (available in the Bookstore)

Your laboratory notebook is to be kept as a diary in which you record all aspects of your experiment. The first page must be a table of contents, listing the name and starting page of each experiment. Each write-up should begin with the title of the experiment, the date, and the name of your partner (if working in pairs). Your entries in the notebook must be clear, legible and meaningful. If you wish to re-write something, simply draw a line through the old text or data. You will not lose credit for making such changes; the grader will simply ignore crossed-out information. And, always make full use of the space available.

You should record what you do as the experiment progresses, using the procedural sections of the laboratory instructions as a guide. When recording data, it is best to make tables. The answers to any questions posed in the instruction sheets should be recorded at the appropriate place in your notebook. Conclude every experiment with a brief essay that summarizes what you have learned; the laboratory manual will guide you on important points to consider in your discussion. This essay is crucial because it is here that you demonstrate your understanding of the material. Science is much more than the careful collection of data; it is a thoughtful analysis that makes the collected data meaningful.

Several of the labs will involve the use of computers situated at each lab table. These computers are to be used only for the requirements of the lab. They may not be used for email, surfing the web, or for any other purpose other than the work of the lab.

Grading:

Each laboratory will be graded on the basis of 10 points maximum. Your grade will be based on how well you performed and analyzed the experiment and, particularly, on how well you communicated what you did through your notebook entries. Laboratory notebooks will be collected at the end of each laboratory session. You are required to do all of the experiments, and to be present for all of your scheduled laboratory meetings.

Final grades will be based both upon the in-class laboratory exercises as well as the four observing lab exercises. Students will be allowed to drop one lab (either an in-class or an observing lab) with no penalty. **Due to the nature of astronomy, the observing sessions will be held outside of the usual lab meeting times for your section. You must attend one of each of the four observing labs listed below.** If none of the scheduled observing labs can be held due to weather, an alternative assignment will be distributed.

Late assignments will be penalized by 5% per day late, and makeup labs are not allowed, without a valid excuse. It is the student's responsibility to have any excuse validated by the Dean of Students office to avoid penalties. If you have a valid excuse, the TA will work with you to schedule a makeup lab session.

Lab grades will not be curved. After all student work is accounted for, a curve may be applied to the midterm and/or final averages if necessary.

Academic Integrity:

Copying work from other students or outside sources is considered plagiarism, and it will not be tolerated. All work must be the individual's own work, except during labs in which students work together as partners. However, both partners must still turn in their own laboratory notebook to be graded individually. Outside references (other than the class textbook) must be properly cited if used on any assignment. Any student found to have engaged in academic misconduct on a graded assignment or exam may be assigned a zero for that assignment, assigned an F in the course, and/or reported to the Dean of Students.

Accommodations for Students With Disabilities:

If you have a disability for which you are or may be requesting accommodations, please contact both the professor and the Office of Academic Support Services, University Center room C212 (610-758-4152) as early as possible in the semester. You must have documentation from the Academic Support Services office before accommodations can be granted.

Tentative In-class Laboratory Schedule:

- Jan. 15: Review of syllabus, no regular lab this week
- Jan. 22: Lab 1: Celestial Coordinates and Motion in the Sky
- Jan. 29: Lab 2: The Orbital Motions of Planetary Bodies
- Feb. 5: Lab 4: Basic Optics, Telescopes, and Wave Properties
- Feb. 12: No in-class lab; observing labs will be held this week
- Feb. 19: Lab 3, part 1: Atomic Spectra
- Feb. 26: No in-class lab; observing labs will be held this week
- Mar. 5: Lab 5: Craters on the Moon
- Mar. 12: Spring Break
- Mar. 19: No in-class lab; observing labs will be held this week
- Mar. 26: Lab 3, part 2: Classification of Stellar Spectra
- Apr. 2: Lab 6: Measuring Stellar Distances
- Apr. 9: Lab 7: Light from Stars and the HR Diagram: Photometry of the Pleiades
- Apr. 16: No in-class lab; observing labs will be held this week
- Apr. 23: Lab 8: Hubble's Redshift Law; observing labs also held

Tentative Observing Lab Schedule:

- Week of Feb. 11: Observing Lab 1: Observation of Jupiter and Pleiades
M, T, W, Th 8:00–9:00 pm (first 2 good nights)
- Week of Feb. 25: Observing Lab 2: Solar Observing
T, W, Th 2:30–3:30 pm (all 3 days)
- Week of Mar. 18: Observing Lab 3: Observation of the Moon and Orion Nebula
M, T, W, Th 8:00–9:00 pm (first 2 good nights)
- Week of Apr. 15: Observing Lab 4: Observation of Saturn and Deep Sky Objects
M, T, W, Th 8:00–9:00 pm (first 2 good nights)
- Week of Apr. 22: Observing Lab 4: Observation of Saturn and Deep Sky Objects
M, T, W, Th 8:00–9:00 pm (first 2 good nights)

As sky conditions are always unpredictable, announcements will be sent by email before 6:00 pm on the scheduled date to indicate whether or not the session is cancelled due to weather. Each observing session will be tentatively scheduled for several days/nights to allow for clouds, but **observing will be held only on the first two clear dates on the schedule. Do not wait until the last tentative date to attend.** Please contact the TA or Prof. McSwain in advance if you are unable to attend any of the scheduled observing sessions.

This syllabus is only a tentative outline of the course. The grading policy, lab schedule, or the topics covered in class may change as needed.