

. AY 203 - Fall Semester 2004

**COURSE: 07:00-09:50 pm Thursday
Room 328 Gallalee Hall**

**INSTRUCTOR: Prof. R. Buta
302 Gallalee Hall
348-3792
Office Hours: WF 10:30-12 or by appointment**

**LAB ASSISTANT: Becky Grouchy
308 Gallalee Hall
348-5081
Office Hours: W 2-3pm**

PURPOSE: AY 203 is a laboratory astronomy class designed to allow students to get to know the sky by making real observations of astronomical objects with telescopes and with the unaided eye. From these observations, students can make measurements of astronomical objects and deduce certain quantities of astrophysical interest with data they have taken themselves. The observing sessions will mostly be carried out on the 4th floor of Gallalee Hall, within and near the dome of the 10-inch refractor which can be seen on the roof. We will also be observing with the department 16 and 17-inch telescopes housed at Moundville State Park. Some projects will involve learning darkroom techniques.

MAIN GOALS: To teach students how to use small telescopes to observe the night sky, star charts for finding specific objects by eye, cameras for astrophotography, and to familiarize them with such concepts as the celestial equator, the north celestial pole, sidereal time, universal time, right ascension, declination, hour angle, rising and setting motions, the ecliptic, and circumpolar stars.

ORGANIZATION: The lab meets formally every Thursday night in Room 313 Gallalee, from 07:00 to 09:50 pm. There will be 14 sessions of this laboratory class during the semester, including one which could be used as a makeup opportunity. All students are required to do the exercises assigned for a given session.

Because of the nature of this class, which is subject to the vagaries of weather, we will have both indoor and outdoor exercises. Which exercise we do on any given occasion cannot usually be specified in advance. Therefore, it is imperative that you **COME TO CLASS ON TIME**.

TEXTBOOK: Norton's Star Atlas, edited by Ian Ridpath. This was ordered belatedly from amazon.com by the department and I will inform the classes when copies are available. The cost will be \$23.

PREREQUISITE: You should really not be taking this course unless you have had some previous astronomy courses, such as AY 101 or one of the other 200 level courses. You should have some knowledge of algebra and trigonometry as well.

GRADING: The grading in this class will be based on a set of lab reports as well as a midterm exam, which will be held on October 14. There will be two types of reports: fill in the blank and regular reports in a journal-type style. I will discuss the guidelines for the reports in class and tell you how they should be arranged and when they are to be turned in. The mid-term will be an essay style exam, based on issues discussed in the various lab exercises. It will count as much as a given lab exercise. There will be no final exam.

INDOOR EXERCISES:

Understanding the celestial sphere using a celestial globe
The orbits of Venus and Mars
Spectroscopy in the laboratory
Rotation of Saturn's Rings
Orbit of a binary star
The retrograde motion of Mars
Analyzing the Hubble Deep Field

OUTDOOR EXERCISES:

The celestial sphere and astronomical coordinate systems
Determining Longitude and Latitude
Use and properties of telescopes (refractors, reflectors, and Schmidt-Cassegrains)
Lunar morphology from visual observations
Photography and observations of the Moon to deduce crater heights, lunar distance, and orbital period
Photography of the planets (morphology, sizes, distances, and rotation periods; masses; identification of moons)
Observations of double stars and binaries
Observations of nebulae, star clusters, and galaxies
Solar rotation (will require daytime measurements)
Spectroscopy with Schmidt-Cassegrain telescopes

LAB MANUAL: There is no formal lab manual; instead, exercises will be handed out in class.

OTHER REQUIREMENTS: Please bring a ruler with a millimeter scale and a calculator to each class. Also, it would be very useful to bring a

flashlight in case we will be observing, and to dress warmly near the end of the semester since it may be very cold on the roof.

LAB PROCEDURE: Each lab measurement that you make, and each lab report that you turn in, must be your own work. You should not rely on someone else to do the work even if you must share some of the facilities. I expect independent work in all lab exercises.