Astronomy 116
Spring, 2001

William P. McKibben

Office: Entrance from Pierce 206
Phone: 4-8333

Astronomy is the science of the Universe, its origin, its structure, its contents, its processes, its evolution and its ultimate fate. Astronomy is the oldest of the natural sciences and continues as a human enterprise because humanity continues to believe that the Universe is comprehensible.

Course Objectives. This course is an introductory survey of the science of astronomy. Students completing this course are expected to have an ordered understanding of the development of humanity's quest for knowledge of the heavens, of the ways in which modern astronomers know the Universe and of the important current questions and issues in astronomy. They are expected to obtain basic knowledge of the Sun, Solar System, stars, galaxies and modern cosmology and of the physical principles underlying modern astronomical understanding. They should be able to recognize objects in the night sky and have the foundations for a lifetime of appreciation and enjoyment of the heavens.

Textbook and Readings. The textbook for the course is Kaufmann and Comins, *Discovering the Universe*, 5th edition, published by W. H. Freeman and Co., 2000. Additional readings from other sources may be assigned from time to time. The reading assignment for each week will be announced at the beginning of class each Thursday. You are asked to bring your textbook to class every class period since we will often need to refer to tables, graphs and illustrations in the textbook during lectures.

Laboratory. Laboratory activities are designed to allow the student to investigate nature using scientific methodology. Attendance at laboratory sessions is mandatory. The regular laboratory schedule will begin in the second week of classes. All laboratory sessions will begin promptly at 8:00 p.m. in the Multimedia Classroom in Humanities Hall.

Laboratory work will consist of investigatory projects based on those from the laboratory manual *Voyages Through Space and Time*, by Jon K. Wooley, Wadsworth, 1995, using *Voyager II* software, as well as actual observation. Ideally each laboratory session would involve both types of activities, but actual observation requires clear skies; therefore, more than one indoor project may be assigned on a particular night. Normally the laboratory will last for three hours.

Laboratory Reports. Students will submit laboratory reports in connection with the computer projects. All reports will require written work and will be judged on the quality of writing as well as on the presentation of the results of the investigations. Standards for reports will be issued and discussed in the laboratory.

Class Conference. A conference, named 116 Astronomy, has been set up. Students should stay "tuned" to the conference. It is hoped that this arrangement will promote discussion among students and your professor. Announcements, assignments, and other matters of interest will be posted on the conference.

Supplemental Observing Sessions. Additional opportunities for observing the heavens will be provided from time to time, especially in connection with

astronomical events of particular interest. Times for such observations will be announced in class or on the class conference. Attendance at each individual observation is not required, although it is required that each student attend at least one of these supplemental observation sessions. At least eight (8) supplemental observations will be offered. Normally transportation, when needed, to an observation site will not be provided.

Observation Journal. Students will maintain a record of observations in a separate notebook, preferably a small spiral notebook. The student will be expected to observe on at least three occasions (supplemental or independent observations) outside the laboratory observation periods and report observations in the journal. Journals will be submitted after the first laboratory observation and at the end of the course. Standards for the journal will be issued and discussed prior to the first observation.

Tests. The tests in Astronomy 116 will include objective as well as essay questions. Some questions will be quantitative in nature. A significant number of questions will stress reasoning with principles. Laboratory material may be included.

There will be three tests during class time on the following dates:

Tuesday, February 13 (Introductory Material)
Thursday, March 8 (Solar System)
Thursday, April 12 (Stars)

Writing Assignments. Writing assignments will be given. For long assignments, details and due dates will be announced with adequate warning.

Presentation. Laboratory groups will prepare and give short, illustrated oral presentations concerning objects in the night sky. Standards will be issued after midterm.

Grading. Course grades will be assigned on the basis of 1000 points, composed as follows:

Tests (3 at 100 points each)	300 points
Laboratory Reports	225 points
Writing Assignments	125 points
Observation Journal	100 points
Presentation	30 points
Comprehensive Final Exam	220 points

In general course grades will be determined, as follows:

A	900 or more points
B	800 to 899 points
C	700 to 799 points
D	600 to 699 points
F	fewer than 600 points

Grades of A-, B+, B-, C+, C-, D+ may be assigned for sums of points near the ends of the grade ranges given above.

Additional Materials. Students will need scientific calculators for laboratory work and often in class. A medium-sized looseleaf binder (3-hole punch) for lab reports, classroom notes and handouts, etc., is recommended.

Absences. As stated above, attendance at laboratory is mandatory. Excused absences for serious reasons are possible , but the missed laboratory work must be made up. The general make-up requirement for one missed laboratory with excuse will be two supplemental observations (in addition to the required one) and independent completion of any computer projects assigned for the laboratory period missed. Unexcused absences must be made up, as well, but in addition to the make-up, a substantial point reduction in laboratory grade will be imposed.

Office Hours. Tuesdays and Thursdays: 2:00 - 3:30 p.m. Additional hours by appointment.

THE HONOR CODE OF OXFORD COLLEGE APPLIES TO ALL WORK SUBMITTED FOR CREDIT IN THIS COURSE.