

ASTR 170B1 (The Physical Universe), Sections 3 and 4H, Spring 2013
MWF 1:00 - 1:50 PM, Steward Observatory, Room N210

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This course satisfies the Natural Sciences Tier 1 requirement. We will focus on astronomy, the observational and theoretical study of objects in our Universe. This course is a broad survey intended for non-science majors and covers some of the questions that stumped astronomers of the past and that puzzle astronomers today. These questions include: What makes the Sun shine? Why are there seasons? What is dark matter? Do Black Holes exist? What is the origin of the Moon? Are we alone in the Universe? and Did the Big Bang occur? The physical principles necessary to understand why these questions are important, how astronomers have learned what they know, and what issues remain uncertain will be discussed in lecture. **The emphasis of the course is on understanding, not on memorization.**

Background

No previous astronomy experience is necessary. You should be familiar with basic algebra, trigonometry, fractions and scientific notation. The development of basic physical concepts as they relate to the detection and workings of astronomical objects will be a fundamental part of the course. A strong interest in the course material is the best prerequisite! You should have a small inexpensive calculator at your disposal (one that does powers, roots, and trigonometric functions). *Please seek help when you encounter a concept that you do not understand.* You are required to use a U of A computer account.

All exams are closed-note and no calculators are allowed. The in-class and final exams will consist of multiple-choice and short written answer questions.

There is no textbook – so attend class!

Evaluation

Your grade in this course will depend on your performance on the homework and laboratory exercises (2/5 of the total), two in-class exams (1/5 of the total), and the final exam (2/5). At the end of the term, the lower of your two in-class exam grades will be dropped. Your worst homework grade will also be discarded.

Honors Evaluation

For the honors section, the course grade will depend on the homework and laboratory exercises (1/3 of the total), two in-class exams (1/6 of the total), the final exam (1/3), and the completed final project (1/6). At the end of the term, the lower of your two in-class exam grades will be dropped. Your worst homework grade will also be discarded.

The creative project is worth the equivalent of one in-class exam, is chosen by the student with the instructor's prior approval, and can take many forms, such as art, poems, short stories, songs, photographic essays, video presentations, model building, original experiments or astronomical observations, or development of lesson plans for grade school. A written report is required for all projects. Abstracts of 1-2 pages for the creative project are due in lecture on March 6. Your abstract will be evaluated and returned to you with comments and suggestions. The final project is due on April 8. The instructor will show some of the more interesting projects to the class at the end of the semester.

Interactive Learning

Several times during the term, students will conduct hands-on astronomy lab exercises or a classroom debate concerning one of the topics discussed in class. Short write-ups of the labs or debates will be due as part of the homework assignment for the next week. Students will have the opportunity to work directly with the instructor and TA in a smaller group at least once during the semester.

Policies

- **Do your own work.** Modern science is collaborative, and people learn from talking to each other. Feel free to talk to the instructor, TA, or other students about homework/laboratory assignments. But the work you turn in must be your own – **don't just copy assignments.** Copying is cheating and will be handled according to university policies. **The instructor subscribes to the University's Code of Academic Integrity.** The Code prohibits all forms of academic dishonesty, including cheating, plagiarism, and facilitating dishonesty by others. The repercussions for those found guilty of violating the Code will include loss of credit for the work and may include failure of the course or more extreme measures.
- **Attendance, participation, and conduct.** Attendance and participation in class are important for your understanding of the course material and your grade. **Students who are regularly absent will be Administratively Dropped from the course.** You are *strongly* encouraged to participate in class by asking questions. Eating, drinking, and texting are not permitted in the lecture hall. Talking is also prohibited unless you want to ask a question during lecture.
- **Late Homework. No credit, WITH NO EXCEPTIONS, will be given for late homework.** Because we want to be fair to those that turn in work on time, we will not accept late work. There is an absolute deadline for homeworks. If you are concerned about not being able to turn in your work in class on the due date, please turn it in early! We will accept homework at any class meeting prior to the deadline. Your lowest homework will be dropped.
- **Missed Tests. No makeup tests, WITH NO EXCEPTIONS, will be administered.** The exams are already scheduled and posted on the class schedule. If you know that you will miss a test, you must make arrangements (for valid reasons) for an oral exam at a time and date prior to the written test. The lower of your two in-class exams will be dropped.
- **There will be no makeup or extra credit assignments near the end of term.** Do not expect to compensate for poor homeworks or exams at the end of the term with additional work.
- **Grading.** You have one week from the time an assignment or exam is returned to challenge any perceived errors. Although rare, there are occasions when grading errors occur, and you should review your returned work. The final course grades will be on a curve, but you can be assured that if you have > 90% of the total number of points available you will receive an A, 80 to 90% at least a B, 70 to 80% at least a C.