

SYLLABUS
Astronomy: The Physical Universe (Astr170B1)
The University of Arizona, Spring 2013

“Space is big. You just won’t believe how vastly, hugely, mind-bogglingly big it is. I mean, you may think it’s a long way down the road to the chemist’s, but that’s just peanuts to space.”
–Douglas Adams

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Office hours: Tuesdays and Thursdays, 11 am - 12 noon

LECTURES: Tuesday-Thursday from 2 pm - 3:15 pm in the Dome at Flandrau Planetarium

COURSE DESCRIPTION

We will study many objects in the universe including the solar system, stars, galaxies, and properties of the universe as a whole. We will introduce the basic concepts used in physics, chemistry, geology and biology needed to better understand these objects. We will make use of mathematical tools at the level of high school algebra, including order of magnitude estimates, scientific notation, and proportionalities. We will write up the assignments using embedded references, which means we will include references to support our arguments and insert such references in full into our manuscripts. We will also discuss and write on relevant topics that appear in the media and on the ballot. The application of making a hypothesis and testing it, the scientific method, will be used throughout this course.

LEARNING OUTCOMES

Upon successful completion of the lectures, a student will be able:

- to understand some basic physics concepts and apply them to astronomy problems
- to gain a knowledge of the physical scales, masses, sizes, lifetimes and other properties associated with a wide variety of astronomical objects
- to analyze the results of lab activities and discussions to better understand topics presented within this course
- Importantly, to learn how by studying Astronomy we can help Earth, and even ourselves. As T. S. Elliot wrote, “We shall not cease from exploration and the end of all our exploring will be to arrive where we started and know the place for the first time.”

These learning outcomes will be met through attendance of lectures, writing assignments, tutorials, in-class activities, field trips, observing, and in-class exams.

OFFICE HOURS and EMAIL

Dr. Frye's office hours are in Steward Observatory 308 and by appointment. To best serve this class, the following email response policy will be followed. In general, emails to the professor will be answered only during office hours, unless they are urgent in nature.

GRADES

Your final course grade will be calculated as follows:

Assessment	Percentage
Midterms	30
Writing Assignments and Labs	30
On-line Homework	10
Final	30

Attendance will be taken with the aid of the 'Clicker,' and experience shows that the "A" students are those who attend all the classes.

REQUIRED TEXT AND READINGS

1. "The Essential Cosmic Perspective", **Sixth** Edition, by Bennet, Donahue, Schneider, and Voit. Note this text is different from the one entitled, "The Cosmic Perspective." This edition is *strongly* recommended, and comes with free online materials and resources. You will be assigned regular readings from the textbook which you are expected to do prior to coming to lectures.

2. You are **required to purchase** access to MasteringAstronomy at:

<http://www.masteringastronomy.com> (class code is: **STARSTUFF**)

You can purchase MasteringAstronomy along with a new textbook OR purchase it separately on-line, with or without the text E-Book option. You will not be able to share access codes with your neighbor, and so will need to purchase one in your own name. You will need to input your code to access homework and occasional labs.

3. If you do not already have one, you will need to purchase a Clicker and can do so in two different ways: 1) go to the bookstore or 2) go online at <https://store.turningtechnologies.com>. If you encounter problems please contact myself and/or my T. A.

COURSE WEBSITE: Desire to Learn (D2L)

This is your first stop to get assignment due dates, class announcements, copies of lectures and laboratory and writing assignments. To access d2L, go to the website, d2l.arizona.edu and click on 'User Login.'

LECTURES

"Practice does not make perfect. Only perfect practice makes perfect."

—Vince Lombardi

The lectures will be complemented by demos, lecture tutorials, field-trips and videos. To accomplish our learning goals, **lectures will move at a pace intended to build and expand upon the assigned reading material, rather than to introduce material for the first time.** The lecture notes will be made available as PDF files, *but these notes are not a substitute*

for attending lectures. Your participation is encouraged during the lecture, which at the very least means you must **bring your clicker to class**. Participation will be taken into account by your registered clicker responses.

While reading your textbook is a good start, it will not be sufficient to do well on the exams. This is because there is significantly more information in this course than can be obtained by passive reading and/or memorizing vocabulary. The lectures are intended to teach you how to think about these conceptionally-rich and difficult topics at the required level to do well on the exams. Even at their best, the lectures will only cover a subset of the required material at the level that you will need in order to do well on the exams, thereby requiring extra reading, thought and/or discussion outside of class. A list of lecture topics appears below:

Week	Topics
August 27-29	Syllabus; Chapter 1
September 3-5	Chapters 2 and 3
September 10-12	Chapters 3 and 4
September 17-19	Chapter 4 and 5; Midterm I (Sep 19)
September 24-26	Chapter 5 and 6
October 1-3	Solar Luminosity Lab and Chapter 7
October 8-10	Chapters 7 and 8
October 15-17	Chapters 8 and 10
October 22-24	Chapter 10; Midterm II
October 29-31	Chapters 11 and 12
November 5-7	Chapters 12 and 14
November 12-14	Chapters 14 and 15
November 19-21	Chapters 15 and 16
November 26	Midterm III
December 3-5	Chapter 18
December 10 (last day of classes)	Chapter 18; Review
December 19	Final exam from 1-3 pm

OBSERVATIONS

You will have the opportunity to visit our telescope on the roof of Steward Observatory's telescope building, and it is required that you go at least one time and submit an observing worksheet. It is highly recommended to go to early, as observing sessions may be canceled with very little notice or even *during* your session. Merely attempting to go one or even several times, but not completing the observation will not count for credit. Note if you know in advance that you will be unable to attend ANY observing sessions then please see ASAP. Observing is available every MTuWTh excluding major holidays.

HOMEWORK

There will be weekly homework from the textbook website at MasteringAstronomy. Please do your own work. No late homework will be accepted as this quickly becomes unwieldy in a class of this size. If there is a true emergency, then please let me know as soon as possible.

LABORATORIES

There will be four laboratory activities in this class, the sum total of which will be worth 30% towards your final grade. They are:

Name	Date
Sunset Lab	Jan - Mar
Observing: Ray White 21inch Telescope	Jan - Apr
Planetarium	Jan and Apr
Solar Luminosity Lab	
The Hubble Lab	April

EXAMINATIONS

There will be three in-class midterms, and one final exam. All exams will be closed notes and closed book, and will be comprised of multiple choice questions. Cell phones, laptops, and all other handheld devices must be turned off and put out of sight. This is not to time to test me with regards to cheating. If you have a true emergency and cannot attend the final exam, please contact me immediately with documentation. There will not be makeup exams in this course. To help account for this, I will drop the lowest midterm score at the end of the semester. If you miss a midterm then you will receive a grade of "0" and this one score will be dropped from the calculation of the final grade. It is not advisable to miss the final exam for any reason. An unexcused absence from the final will result in an F for the entire course.

There will be opportunities to earn extra credit by attending evening public talks on astronomy on campus. Here is the website: <https://www.as.arizona.edu/pubevelec.html>

ACADEMIC HONESTY

I follow the policies outlined in the Dean of Students code of academic integrity, including cases of plagiarism and cheating (see <http://deanofstudents.arizona.edu>). I strongly encourage you to work with your peers on the homework assignments. Such collaborations can include discussion of the qualitative concepts and on the mathematics, but in the end you must write-up and submit your own work using your own words. If an assignment even only *appears* to be copied from someone else, or copied from a source without a reference, or copied from a referenced source and only a few words changed then the assignment will be assumed to be plagiarized. I will give a grade of "F" for the assignment, and further to that the Dean may assign a grade of "F" for the whole course and/or pursue a more stringent repercussion.

Note that copying large amounts of text even with proper references will result in a low grade. One can avoid such 'lazy writing' by talking over what you intend to write with a peer, your teaching assistant or professor, through email or conversations during office hours, until there is enough confidence in your answer that you can write the answer down on paper in your own words. Another trick is to use direct quotations that are short and infrequent.

Cheating is the second type of serious infraction. Some examples include: cheating on an exam, use of electronic devices or translators without prior consent from your professor, substituting someone else to take an exam and changing an answer to an exam/assignment after the document has been returned to you.

ATTENDANCE AND CLASSROOM ETIQUETTE

The students are expected to attend all lectures, lab sections, and the required observing session. Please turn off cell phones in class, and refrain from extraneous talking, distracting/discourteous behavior, distracting use of laptops/cell phones, and coming late and/or leaving early. Please bring your clickers to class each day as the clickers will be used to take attendance. If you are interested to use a laptop to take notes during the lecture you are requested to sit in the first five rows of the lecture hall.

WRITING ASSIGNMENTS

You will have a few opportunities to communicate scientific ideas through writing assignments. Examples of writing assignments are the Sunset Lab write-up on archeoastronomy, the Solar luminosity writeup and the term paper. Of these, the Sunset Lab and term paper must include embedded references, which means we will include references to support our arguments and insert such references in full into our manuscripts. . Otherwise the student will receive a 0 for the assignment. Here are a few more details about the various writing assignments.

The Sun Lab Writeup is a straightforward write-up of the laboratory experiment plus a short answer essays. The Solar Calendar assignment includes a writeup and a longer essay on the topic of, “Archeoastronomy of the ... (insert favorite world site here).”

All write-ups will be graded according to the formula used in the Writing Program of the Department of English: Content (50%), Organization (20%), Expression (20%), Mechanics (10%). All writing must be single-spaced and with a maximum font size of 12 pt and no smaller than 11 pt. Handwritten assignments are technically acceptable, but will be returned if they are illegible.

All writing assignments should be submitted in-class before the start of class. Assignments may also be turned in prior to the due date. Late assignments, or assignments submitted elsewhere (my mailbox, for example) will not be accepted as such administration becomes too unwieldy for a class of this size.

ASSISTANCE

I and my TA are here to help you, so please take advantage of office hours. We want to get to know you, so you are very welcome to stop by to introduce yourself. See Page 1 of this syllabus for our contact details.

Please contact me promptly if you have any questions or concerns regarding this class. If you would like extra tutoring you may attend the FREE weekly astronomy tutoring “Think Tank.” held on the ground floor of the Manzanita-Mohave dormitory every Sunday, starting September 8th, 2013, from 6-9 pm (<http://thinktank.arizona.edu/>).

If disability-related assistance is required, please contact the Disability Resources office (621-3268; <http://drc.arizona.edu/>) and also please let me know. I, together with the DR office, can then work together to ensure your full participation in this course.

From experience, students find this to be challenging class, and in a rewarding way. I delighted to be able to teach this course, and am looking forward getting to know you and to learn from you as well. Good luck!