

Astronomy 170B1, Section 3 - The Physical Universe Fall 2015

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Office Hours: Wednesday, 2:00-4:00 p.m.
- Lectures:** Monday/Wednesday, 11:00 a.m. – 11:50 a.m.
Steward Observatory, Room N210
- Discussion Sections:** Friday, 11:00 a.m. – 11:50 a.m.
Steward Observatory, Room N210
Steward Observatory, Room 208
ILC, Room 125
- Midterm Exams:** Friday, September 25, in SO N210
Friday, October 23, in SO N210
Friday, November 20, in SO N210
- Final Exam:** Wednesday, December 16, 10:30 a.m. – 12:30 p.m, in SO N210
- Websites:** <https://d2l.arizona.edu/>
<http://masteringastronomy.com/> (instructions below)

Course Description:

The Physical Universe is a survey of modern astronomy. Astronomy is a fast moving field covering an enormous range of phenomena, we will examine many topics including: the Earth, its Moon, our Solar System, distant planets, stars, galaxies, black holes, and the Big Bang. We will also use astronomy to learn about the nature of scientific inquiry, the process by which we learn about the world we live in. You will see the scientific method in action as we follow the discoveries that have led to our current understanding. This course is an approved Tier One course in the Natural Sciences study area of the General Education Curriculum.

Course Objectives:

At the end of this course, you will have familiarity with large parts of astronomy and be able to understand the context of astronomical research you may see reported in newspapers and magazines. You should understand aspects of astronomy that touch your daily life, including the seasons and lunar phases, and be able to explain to your friends and family that the moon is up in the daytime and that we are not closer to the Sun in summer. More importantly, you will

understand the scientific method and the way in which scientific reasoning increases our understanding of the natural world. Science plays an important role in modern society and scientific issues are constantly under public discussion, this course will help you critically evaluate the positions in these debates and form independent conclusions.

Style of Instruction:

This course will meet on Mondays and Wednesdays for lecture periods, and will divide into three discussion/laboratory sections on many, but not all, Fridays. The lectures will be as interactive as possible, interrupted with discussion and peer instruction. The laboratory sections will involve small group work. Be prepared to interact with the instructors and with your peers, to interrupt and ask questions, to learn from each other, and to report to the class on these activities.

Required Textbooks:

The required course text is:

The Cosmic Perspective, 7th Edition
with *Mastering Astronomy* website access
by Jeffrey Bennett, Megan Donahue, Nicholas Schneider, & Mark Voit

Access to the *Mastering Astronomy* website (for all homework) is also required (see final page of this syllabus).

The textbook and *Mastering Astronomy* access are sold in the bookstore as a bundle with ISBN [9780321839503](#). Alternatively, you can purchase an electronic textbook and *Mastering Astronomy* access bundled together from the *Mastering Astronomy* website.

Grading:

Your grade will be determined by the following components:

Midterms	30%	(best two out of three)
Final	15%	
Homework	30%	
Written Assignments	12%	
Laboratory Activities/Attendance	8%	
Attendance/Quizzes	5%	

The percentage thresholds for letter grades will be:

A = 90% B= 80% C=65% D=50%

I reserve the right to make the grading slightly easier, but will not raise these thresholds.

Assignment/test grades will be final one week after they are entered, please bring questions, disputes, or mistakes to my attention immediately.

Midterms/Final:

There are three midterms. The lowest of your midterm scores will be dropped. Together, the midterms and final comprise half of the course grade.

Attendance at the exams is mandatory, there are no make up exams. The dates for the midterms and final are listed on the first page and will not change. If you cannot make one of the exam dates, consider switching to a different section of this course. If you do miss a midterm for an emergency, it will count as your dropped test.

Homework:

Homework assignments will consist of problem sets on *Mastering Astronomy*. These problems are intended to reinforce the concepts addressed in lecture and in the readings.

Assignments will be due approximately weekly at the start of a class session. Late homework is accepted, but 10% of the credit is lost each day, until you reach 50%. To encourage you to complete the assignments, 50% credit is possible until the day of the final exam.

Extra points are often made available to assist you in learning the material and to help improve your overall homework score. However, you may not receive more than 100% on the homework portion of your final grade.

Written Assignments:

Over the course of the semester you will be asked to read three articles on research of interest to the course, taken from major publications and intended for a general audience. Your task will be to understand these articles and write about them (approximately 1 page per essay). A grading rubric will be provided with the assignments. Detailed written feedback will be provided on one essay for each student. Due dates are listed in the course schedule.

Laboratory Activities:

The Friday breakout sessions will provide supplementary instruction, scientific experiments, and group learning activities. Attendance at these sessions is recorded and 6 out of 7 are required to receive full attendance credit. A makeup lab will be available for people with approved absences. Some lab activities will be graded.

Attendance/Quizzes:

Attendance is strongly encouraged, and is part of your grade. If the lectures and discussions are operating as intended, the interactions between us will be far more valuable to your success in this course than whatever time you could save by skipping class.

Your presence will be recorded through note cards distributed in the lecture. The cards will also be used for occasional short, graded quizzes to verify your knowledge and encourage you to read the textbook in advance. Attending 75% of the lectures is good enough for full attendance credit. Turning in a card for someone else is not allowed and will be treated as a violation of the Code of Academic Integrity.

Extra Credit:

Extra credit opportunities will occasionally arise and will be announced in class. They will have a value comparable to homework assignments. You may not obtain more than 4% of the course grade through extra credit.

Learning Support:

I want to ensure that you are able to succeed in this course. Over the semester I will provide frequent opportunities for direct feedback on the course, and will be able to see progress in learning through the homework and tests. The office hours for the TA and myself are listed on the first page, please make use of us.

Tentative Schedule:

The textbook (*Cosmic Perspective*) is tightly connected to the course structure. You are expected to read the *Cosmic Perspective* chapters below in advance of lectures. There will be quizzes to encourage you to do this.

Date	Topic	Reading
08/24	Cosmic scales	1
08/26	Seasons/sky	2.1-2.2
08/28	Moon/eclipses	2.3
08/31	Planetary motion, Science	2.4, 3.1-3.4
09/02	Kepler/Galileo	3.3
09/04	Lab #1	
09/07	NO CLASS	
09/09	Newton	4.1-4.2
09/11	Force and motion	4.3-4.4
09/14	Light	5.1-5.2
09/16	Spectra	5.4
09/18	Lab #2	
09/21	Telescopes	6
09/23	Solar System Formation	7.1-7.2, 8.1-8.2
09/25	Midterm #1	
09/28	Terrestrial Planets	9.1-9.2
09/30	Atmospheres	10.1,10.4-10.6
10/02	Lab #3	
10/05	Climate	10.6
10/07	Outer Planets, Leftovers	11, 12
10/09	Pluto, First Essay Due	
10/12	Sun	14.1-2
10/14	Stars	15.1
10/16	Lab #4	
10/19	HR Diagram	15.2
10/21	HR Diagram	15.3, 16
10/23	Midterm #2	
10/26	Low Mass Stars	17.1-17.2
10/28	High Mass Stars	17.3-17.4
10/30	Lab #5	
11/02	Stellar Afterlife	18.1-18.2
11/04	Black holes	18.3, 19.4
11/06	The Milky Way Galaxy, Second Essay Due	19.1-19.2
11/09	Galaxies	20.1-20.2
11/11	NO CLASS	
11/13	Lab #6	
11/16	Distances	20.2
11/18	Age of the Universe	20.3
11/20	Midterm #3	
11/23	Dark Matter	23.1-23.3
11/25	Dark Energy	23.4
11/27	NO CLASS	
11/30	Big Bang	22
12/02	CMB	22
12/04	Lab #7, Third Essay Due	
12/07	Other planetary systems	13, 24.1, 24.3
12/09	Life	
12/16	Final	

Students with Disabilities:

If you anticipate barriers related to the format or requirements of this course, please meet with me so that we can discuss ways to ensure your full participation in the course. If you determine that disability-related accommodations are necessary, please register with Disability Resources (621-3268; drc.arizona.edu) and notify me of your eligibility for reasonable accommodations. We can then plan how best to coordinate your accommodations.

Some accommodations, such as extra testing time, will require scheduling with the DRC and advance work on my part. You will remain responsible for scheduling a test-taking spot in the DRC well in advance of all tests (>1 week). You must also notify me that you intend to use this accommodation so that I may submit materials to them in time. In order to ensure that this process runs smoothly, please notify me as soon as possible, preferably within the first two weeks of the course.

Classroom Etiquette:

In order to provide an environment conducive to learning and interaction, the following policies will be enforced:

- No eating or drinking (other than water) in the classroom
- Cell phones must be turned off and out of sight
- Laptops may be used for note taking only, but only in designated sections of the room.
- Late arrival and early departures are strongly discouraged and the disturbance they cause to neighboring students must be minimized

Violators will be ejected and we will record you as having missed class. We will work very hard to foster a stable learning environment during lectures and expect your cooperation in this effort.

Academic Dishonesty:

Presentation of any work other than your own is considered academic dishonesty. This includes copying test answers or homework assignments, other persons taking exams for you, or reference to any unauthorized materials during the exam. Any other technique that gains unfair advantage over other students is also considered academically dishonest. All students must be prepared to present valid picture identification if requested during an exam period. Any incidents of academic dishonesty will be dealt with according to the University of Arizona's Code of Academic Integrity. A copy of this Code can be obtained at the Dean of Students website:

<http://deanofstudents.arizona.edu/codeofacademicintegrity>

The consequences can range from loss of credit on an assignment to dismissal from the University, depending on the severity of the offense. In our class, the penalty for plagiarism or cheating on an exam will be automatic failure of the course and, depending on the circumstances, we may seek your suspension or expulsion from the University.

You should also be aware of the University's policies on disruptive and threatening behavior:

<http://deanofstudents.arizona.edu/accountability/disruptive-student-behavior>

turnitin.com:

By continuing in this course, you are agreeing to submit your written assignments online to a plagiarism-prevention program called TurnItIn.com. When you set up your individual account with TurnItIn.com, make sure you understand and consent to all the terms that the program provides you at that point. You should note that TurnItIn.com will retain your writing (without your name or other identifying information) as part of their database so that students who

plagiarize from it can be detected. Because of this program, the vast majority of you who do your own work and cite your sources of information properly will not have to compete with students who commit plagiarism. Anyone who has questions or problems with TurnItIn.com may talk privately about these with Dr. Marrone.

INSTRUCTIONS FOR OPENING AN ACCOUNT ON *MASTERING ASTRONOMY*

1. Go to <http://www.masteringastronomy.com>
2. Click on the “Student” button under “Register Now” on the right side of the page.
3. “Do you have a course ID?” Click “Yes” and enter **MARRONE15FALL** in the box. It should turn green.
4. “Do you have an access code?” Answer “YES, I have an access code.” if you got one with your textbook. Create a username and password or log in with your existing Pearson account. Enter your access code Go to step 6.
5. Answer “NO” if you did not get a book with a new Mastering Astronomy access code.
 - a. Select the correct textbook (“Bennett et al, The Cosmic Perspective, 7/e”).
 - b. Choose whether to buy the eText (eBook).
 - A Mastering Astronomy account, without the eText, will cost \$60.50.
 - A Mastering Astronomy account plus the eText will cost \$91.70.
 - c. Create a username and password if you do not have one.
6. Return to the login page and enter the site with your new Login ID and password.
7. **IMPORTANT:** when prompted, enter your **University of Arizona NetID**

If you have registration questions or problems with Mastering Astronomy, visit <http://247pearsoncd.custhelp.com/> and follow the links to get assistance.

NOTE ON D2L:

To access your course on D2L you must have a UA NetID and be officially enrolled in the course for at least 24 hours. Your browser and its settings must be compatible with D2L.