

Astronomy 25 - General Information

Lectures: TR 4:40-6:00PM, Roessler 55

Course Web Site: <http://smartsite.ucdavis.edu> (choose AST025)

Course Description

This class is an introduction to astronomy. In it, we will cover the history, content, and fate of the universe. Unfortunately, the universe is really, really big, and ten weeks is not nearly enough time to cover everything! Instead, we're going to try to cover some of the really cool stuff and provide you with the background to understand some of the crazy things that you have read about in the news -- black holes, exploding stars, the birth of galaxies, the expansion of the universe. The first part of the class will be devoted to scientific and mathematical methods, the forces of nature, matter, energy, and light. The second part will focus on our Sun, and the life cycles of stars. Finally, we will learn about the Milky Way, other galaxies, and the observable history of the universe, including the expansion and the Big Bang.

In order to get the most out of class, you should read the chapters beforehand so that you are familiar with the material that I will be covering. To encourage this, there will be on-line quizzes.

Textbook:

There are many versions of the textbook that you can get. However, absolutely **DO NOT BUY** any textbook called "The Solar System" by these same authors. That book will work fine for the first three weeks of the course, but after that it will be useless and you will have wasted your money.

That being said, there are six possible textbooks that are fine for this course. All of the books are by Bennett, Donahue, Schneider, and Voit. You can either buy "**The Cosmic Perspective**", which is the full textbook and contains material for both this course and Astronomy 10S, or "**Stars, Galaxies, and Cosmology**", which contains only the chapters out of "The Cosmic Perspective" that we will be reading in this course. The textbook web site is [Mastering Astronomy](#). There are many editions of the textbook. You should buy **the 4th edition or later (4th, 5th, 6th,...)**. Earlier editions will have different chapter numbers and slightly different material.

Grading:

25% Homework (lowest homework will be dropped)

10% Quizzes (lowest quiz will be dropped)

5% Clickers and In-class participation

20% First Midterm

20% Second Midterm

20% Final

Please note that any clear evidence of cheating on any of the graded material will be reported. See <http://sja.ucdavis.edu> for possible consequences.

Homework and Office Hours:

There will be weekly homework assignments to help you digest the material. The midterms and final will be based on problems similar to those covered in the homework assignments. It is extremely important to keep up with the homework assignments; it gives both you and me feedback about how well you understand what's going on before the exams! You should expect to spend 2-3 hours per week reading the material in addition to the time required for the homework. Homework will be due in class, **at the beginning of lecture**, one week after being assigned. The homework will be available via the class web-site. Solutions to the homeworks will be posted. The solutions provide a good study guide for the exams.

You may work on your take-home assignments together, but the submitted version must be written up individually. While I encourage you to work collaboratively, this is very different than copying. If we detect copied work, you will be referred to Student Judicial Affairs.

The grader and I will hold weekly office hours. These are optional, but are intended to help you out with any questions that you may have on either the homework or the material covered in class. We are friendly, so please consider coming if you have any questions.

Quizzes:

Every week there will also be a quiz that is assigned. The quiz is open-book and can be done at any time before the assigned cutoff time (usually 1PM on the due date). The quizzes will be very easy, and are intended to get you to read the material that will be covered during the week. The quizzes will be accessed via the course site on SmartSite.

In-class Participation ("Clickers"):

A portion of your final grade will come from your in-class participation. During each class I will ask the whole class a question, and you will answer by using a "clicker". The clickers that we will use for this class are the iClickers. They should be available for purchase at the UCD bookstore.

Exams:

The three exams in this class will test your knowledge, understanding, and comprehension of the course material. The questions will come from the text, lecture notes, and exercises. The exams will be multiple choice plus short answer, will cover specific chapters, and will be cumulative only in the sense that most lectures build on the materials in the previous lectures. All exams will be in our normal classroom. The exam dates are given on the syllabus.

Labs:

There is a lab associated with this class. You get to look at the stars, see some of the things we talk about in class, and have a lot of fun. It also can affect your final grade, so please attend. Information about the labs is on the course smartsite.

Astronomy 25 - Fall 2012 - Syllabus

Note: syllabus may change, keep checking the website

| Date | Topics | Lecture | Assignment Due | Associated Reading | Relevant Links |
|------------------|---|----------------------------------|----------------|---|---|
| Thurs, 27 Sep | Intro to the Universe. Astronomical scales and units. | Lecture 1 | | Chapter 1 | Interactive Scales in the Universe (very cool!) How big is the Universe? Scientific Notation Significant Figures |
| Tues, 01 Oct | Motion, mass, and Gravity. | Lecture 2 | Quiz#1 | Chapter 3.3-3.5 Chapter 4.1-4.2, 4.4 | |
| Thurs, 04 Oct | Matter and Energy The Virial Theorem | Lecture 3 | HW#1 | Chapter 4.3, 4.5 (except for tides) Chapter 5.3 | |
| Tues, 09 Oct | Light and Thermal Radiation | Lecture 4 | Quiz#2 | Chapter 5.1-5.2, 5.4 | |
| Thurs, 11 Oct | Spectral Lines | Lecture 5 | HW#2 | Chapter 5.4-5.5 | |
| Tues, 16 Apr | Telescopes | Lecture 6 | Quiz#3 | Chapter 6 | See the Big Scopes Laser Light Show |
| Thurs, 18 Apr | Our Sun How Stars Produce Light | Lecture 7 | HW#3 | Chapter 14.1-14.2 | The Neutrino Problem |
| Tues, 23 Oct | Midterm I | Midterm I (ch. 1, 4-6) | | | |
| Thurs, 25 Oct | The Properties of Stars | Lecture 8 | | Chapter 15.1 | Stellar Spectra |
| Tues, 30 Oct | The H-R Diagram Star Clusters | Lecture 9 | Quiz#4 | Chapter 15.2-15.3 | Hipparcos H-R Diagrams |
| Thurs, 01 Nov | The Death of Low- Mass Stars White Dwarfs | Lecture 10 | HW#4 | Chapter 17.1-17.2, 17.4 | |
| Tues, 06 Nov | The Death of High- Mass Stars Two types of Supernovae Neutron Stars | Lecture 11 | Quiz#5 | Chapter 17.3 Chapter 18.2 Chapter S4.3-S4.4 | Watch a Star Blow up Stellar Evolution Chart |
| Thurs, 08 Nov | Black Holes Gravity and the Curvature | Lecture 12 | HW#5 | Chapter 18.3 Chapter S3.1-S3.3 | Truth about Black Holes Voyage to a Black Hole Fall into a Black Hole |

of Spacetime

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| Tues, 13 Nov | Introduction to Galaxies The Milky Way | Lecture 13 | Quiz#6 | Chapter 19.1 | Pictures of the Milky Way Structure of the Milky Way The Local Group |
| Thurs, 15 Nov | Midterm II | Midterm II (ch. 14,15,17, 18,S3,S4) | | | |
| Tues, 20 Nov | Galaxy Components and Types | Lecture 14 | | Chapter 19.1, 20.1 | Galaxies Galore |
| Thurs, 22 Nov | Thanksgiving | Thanksgiving | | | |
| Tues, 27 Nov | Motions in Galaxies Dark Matter Gravitational Lenses Galaxy Clusters | Lecture 15 | Quiz#7 | Chapter 22.1-22.2 Chapter 20.1 | |
| Thurs, 29 Nov | Formation of Galaxies Galaxy Mergers | Lecture 16 | HW#6 | Chapter 19.3 Chapter 21.1-21.2 | Fate of the Milky Way Galaxy Merger Simulations |
| Tues, 04 Dec | Distance Measurements The Expansion of the Universe. | Lecture 17 | Quiz#8 | Chapter 20.2-20.3 | |
| Thurs, 06 Dec | Curvature of Spacetime. The Fate of the Universe. | Lecture 18 | HW#7 | Chapter 22 Chapter S3.2 | |

**Fri, 14
Dec**

FINAL EXAM at 10:30AM (Roessler 55)
