

ASTRONOMY 301

Introduction to Astronomy

Fall 2014 Unique No. 48520 | TTh 12:30-1:45 pm | WEL 3.502

PROFESSOR

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TEXTBOOK

Required: **We're Texas: Astronomy** by Winget, Hermes, and Shawl et al. (any edition)

LEVEL OF COURSE

This course is a descriptive survey of the field of astrophysics. I will not emphasize mathematics. An understanding of basic algebra, however, will be helpful to you. The course will provide you with a perspective on the universe: its scale, structure, contents, and evolution. It will cover major scientific revolutions in human thought including special and general relativity and quantum mechanics, up to and including our current struggles to understand dark matter and dark energy.

EXAMS AND GRADES

There will be a total of four in-class exams. Your grade will be determined from the best three exam scores, weighted 25% each. Three homework assignments, equally weighted, will constitute 15% of your overall grade. An astronomical observing assignment will account for an additional 10%. You have the **option** to complete a semester project, on a topic of your choosing to replace your lowest exam score (it may not replace a 0). The TAs or I must approve the topic in advance of the topic deadline. As a result of this grading policy, **we do not give make-up exams**. This course is finished on Dec. 4; there will be no exam during the finals period.

At the end of the semester, your total points out of 200 may translate to the following letter grades:

A: 200-180; B: 179-160; C: 159-140; D: 139-120; F: 119-0

We reserve the right to award students immediately below a grade boundary a "plus" grade (e.g., B+, C+), based on attendance and in-class participation—this will be gauged based on your answers to questions posed in-class. Note that because there is no "A+" in our current system, we assign no "minus" grades.

OPTIONAL SEMESTER PROJECTS

The optional semester project is very open-ended, but should relate astronomy to something you are passionate about. This is a chance for you to be creative, and spend time researching and thinking about astronomy from a perspective that interests you. We want you to learn and enjoy the experience, mindful also that the optional project counts as much as an exam, so the work you put into it will be reflected in the grade you get out of it. The deadline for optional semester project approval is **Thursday, 25 September 2014**. Please double check with Keaton or Bohua to make sure that we have your topic written down and not just simply verbally approved. You may not work in groups for the optional project; all work must be your own. Stuck without an idea? Start with these questions: What is a major life interest—an academic major or a hobby? What do you

enjoy creating or doing, and how can you connect it to astronomy? If you are having trouble finding a connection of an interest or passion to astronomy, come see us; we are here to help you! The **firm deadline** for turning in projects is **Tuesday, 2 December 2014**. You may turn projects in during class or during our office hours. You are free to submit your project earlier than the firm deadline. The projects will be graded about a week after the last class day. Project grades will be posted on Canvas. After they are graded, the projects will most likely end up in my office or the adjacent research lab for safekeeping. Please schedule a time via email to pick them up from us once the semester is complete.

DUMB QUESTIONS

There is no such thing as a dumb question. **ASK!!**

COURSE WEB SITE

Please visit the Canvas page for this course to find regular updates.

STUDENTS WITH DISABILITIES

Upon request, the University of Texas at Austin provides appropriate academic adjustments for qualified students with disabilities. You can find resources and contact information online at the web site for the Disability Resources Center: <http://www.utexas.edu/disability>.

TENTATIVE TEST SCHEDULE

There are four in-class exams. We will hold a review the evening before each exam, although not necessarily in our classroom. We will announce the rooms in class as soon as they are scheduled. We have currently estimated that the four multiple-choice exams (it is subject to change) will be on the following dates.

Exam 1: Sep. 18; Exam 2: Oct. 14; Exam 3: Nov. 11; Exam 4: Dec. 4

TENTATIVE COURSE OUTLINE (WITH SUGGESTED READING)

Week 1 (8/28)	Course Introduction; A Tour of the Universe (Ch. 1,2)	
Week 2 (9/2,4)	The History of Science; Basic Concepts; The Night Sky (Ch. 3,4)	
Week 3 (9/9,11)	The Earth and Moon (Ch. 6)	
Week 4 (9/16,18)	The Earth and Moon (Ch. 6)	Exam 1
Week 5 (9/23,25)	The Terrestrial Planets (Ch. 7)	
Week 6 (9/30,10/2)	The Jovian Planets (Ch. 8)	
Week 7 (10/7,9)	Comets; Solar System Formation; Planets Around Other Stars (Ch. 5)	
Week 8 (10/14,16)	Light, Matter, and Energy (Ch. 9)	Exam 2
Week 9 (10/21,23)	Light; Telescopes (Ch. 10)	
Week 10 (10/28,30)	Stars and Their Radiation (Ch. 11)	
Week 11 (11/4,6)	Stellar Classification (Ch. 12,13)	
Week 12 (11/11,13)	Star Formation; How Stars Shine (Ch. 14)	Exam 3

Week 13 (11/18,20)	The Death of Stars; Black Holes; Star Clusters (Ch. 15,16)	
Week 14 (11/25)	Galaxies; Active Galactic Nuclei; Supermassive Black Holes (Ch. 17,18,19)	
Week 15 (12/2,4)	The Big Bang; Cosmology (Ch. 20)	Exam 4

RECOMMENDED EXAM PREPARATION STRATEGIES

- Form study groups of 3 and meet throughout the semester.
- Attend exam reviews the evenings before each exam prepared to ask questions.
- Read the recommended textbook chapters to enhance your understanding.
- Explore all supplementary content linked on the Canvas page; many of these are interactive demos or videos meant to enhance your physical intuition.
- The practice exams are actual exams from a past year, so expect the same format with similar emphases.
- Try to explain the covered concepts to someone who doesn't already know them. If you can concisely but accurately describe these ideas to the uninitiated, then you really have a good grasp of them.
- Go through the notes and the reading and try to come up with your own exam-style questions. Think about a topic and try to figure out all the insightful ways you could probe whether someone else deeply understands that topic with a multiple-choice style question.
- Don't wait for us to post the answers to the practice exam to score yourself. Go through the notes and book and score the practice exam from there. Don't only make sure that you know why each correct answer is correct, but also why each incorrect choice is wrong.

STAR PARTIES

Learning about astronomy from lectures and a textbook cannot replace the thrill of observing the heavens with your own eyes. Weekly star parties on campus are great opportunities to do just that. To learn more about free Wednesday (RLM Building), and Friday and Saturday (Painter Hall) events, visit

<http://outreach.as.utexas.edu/public/viewing.html>