

Astronomy 301: Introduction to Astronomy

Spring 2013 — Unique Number 47925

- Meetings:** TTh 12:30–2, in WEL 3.502
- Course Website:** <http://www.as.utexas.edu/astronomy/education/courses.html>
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- Required Text:** *Astronomy: A Beginner's Guide to the Universe*
authors: Eric Chaisson & Steve McMillan
Addison-Wesley, 6th edition
- Grading:** Seven Half-Hour In-Class Tests
Optional Final Exam: Can replace grades of two previous exams
Exam cadence: Approximately every two weeks
Students with special needs may request appropriate accommodation; call UT's office of Services for Students with Disabilities, 471-6259.
(<http://www.utexas.edu/diversity/ddce/ssd/>)

Subject Matter, Goals, and Miscellaneous Comments

What is it? To whom am I speaking? Astronomy 301 is an introduction to astronomy that is intended for non-science-major students. If you have a lot of math/physics background you probably should register instead for AST 307, which is aimed at science and engineering majors. Natural Science majors cannot count AST 301 (probably even as an elective).

What are prerequisites and expectations of the students? There are no formal course prerequisites. We expect that any UT student should be able to do well in AST 301. Some math at the level of high school algebra will be required for the tests. We will expect you to practice and be comfortable with such things as scientific notation, and simple manipulation of basic astronomical formulae. Are you rusty in such math skills? We will be happy to help you! The math level should in no way challenge anyone who has met the UT math requirement.

How will grades be determined? Approximately every two weeks there will be an in-class test that will last about 30 minutes. Seven of these tests in all will be given. There will be regularly-scheduled, non-compulsory help/review sessions. They are informal, and will focus on helping you with the course material. We will structure these sessions to suit your needs, so please come loaded with YOUR questions. In general, attendance at these sessions will probably help you more than coming to our official office hours. We will give an *optional* final exam. If you choose to take it, this comprehensive exam will replace your two lowest test grades. Because this option is available, there will be no makeup opportunities for the in-class tests.

Textbook & class notes? We will use the 6th edition of *Astronomy: A Beginner's Guide to the Universe*. You will be given instructions on how to access the on-line materials referred-to by the book. On the class website I will be posting copies of the slides that accompany my lectures.

Additional Comments We want you to do well in this course! To that end, a couple of points should be emphasized. First, we encourage you to ask questions in class. This is of course not always easy in a large classroom (and I often partially darken the lecture hall to project astronomical images, etc. If I don't see your hand raised, feel free to speak up! Second, remember that *the only truly stupid question is the unasked one*.

Your progress through this class will be greatly enhanced through interactions with us. Take advantage of the regular review sessions. My home telephone number is listed on the first syllabus page. Use it at any reasonable hour of the day or evening (<11 PM or so). See also my electronic mail address. However, I *GREATLY* prefer phone calls to emails, because I receive on average about 25-30 emails/day on various (legitimate!) matters, and email exhaustion simply sets in on some days. I would far rather talk to you in person or over the phone than go back and forth with emails.

A warning must be given, one that is generally applicable to all astronomy faculty members here. In our courses you interact with professional astronomers. The good part is that you get very close to current research, and that can be very exciting. The bad part is that we tend to travel a bit (most obviously to observatories in remote and exotic locales), and

probably I will need to excuse myself from class a couple of times during the semester. At present I have a McDonald Observatory run for which I must leave on Monday afternoon February 18, and return on Tuesday February 25. This means that I will miss class on February 19, 21, and 25. A substitute lecturer will pinch-hit for me in class on those occasions. All class meetings will occur as scheduled.

Preliminary Course Outline (subject to revision)

Our presentation of topics will follow a fairly traditional path. First, we will discuss what might be called “natural phenomena”, which are those things that you can easily observe and understand without any telescopic equipment. Then we will introduce the physical concepts (gravity, light properties, etc.) that are necessary to understand the major astronomical phenomena. Then there will be exploration of astronomical objects in a standard near-to-far manner: first our solar system, then stars and the interstellar medium sort-of together, then our Milky Way Galaxy, and finally galaxies and the structure/evolution of the whole Universe.

There is a lot of material that we could cover in this course! Many more fascinating topics are discussed in our textbook than we can possibly cover in one semester. A major part of the lectures will be devoted to taming and shaping the material, picking and choosing what to emphasize as we go along. It is important that you attend the lectures and study the web site slide sets to guide your study. Here is a rough outline of topics and when they might arise during the semester, but it is subject to adjustments later.

1. Week 1: Natural phenomena – Text Chapter 0
2. Week 2: Motions, mostly orbits – Text Chapter 1
3. Week 3: Light, the bringer of information – Text Chapter 2
4. Week 4: Practical tools, telescopes – Text Chapter 3
5. Week 5: The solar system in general – Text Chapter 4
6. Week 6: Earth, Moon, terrestrial planets – Text Chapters 5,6
7. Week 7: Giant planets and debris – Text Chapters 7,8
8. Week 8: Our Sun in brief, star observations – Text Chapters 9,10
9. Week 9: Star formation and evolution – Text Chapters 11-12
10. Week 10: Stellar deaths, wimpy & spectacular – Text Chapter 13
11. Week 11: The Milky Way – Text Chapter 14
12. Week 12: Galaxies normal and weird – Text Chapter 15
13. Week 13: Galaxies and their part in the Universe – Text Chapters 15,16
14. Week 14: The birth and growth of the Universe – Text Chapter 17
15. Week 15: Is there life out there? – Text Chapter 18