Course Overview

Official Course Catalog Description: Discover the universe: planets, stars, galaxies, and our place in the cosmos; the Big Bang; how stars shine; comets, meteors, nebulae, the Milky Way; black holes and other exotic objects. Not open to students with credit in Astronomy 201.

Purpose and Course Content: This course will survey various topics in modern astronomy, with the goal of understanding and appreciating the wonders of the Universe. Emphasis will be placed on understanding concepts, and not simply on memorizing astronomical jargon. We will discuss how we are able to understand the Universe through the use of the Scientific Method, and how we can often use everyday experiences here on Earth to help us understand the Universe and its contents. I want you to appreciate the difference between an objective understanding of the world based on observational data, and a subjective view of the world, based on beliefs. “Critical thinking” here means objective, rational, and logical thinking.

Student Learning Outcomes: Upon the successful completion of this course, the student will

- Explain in detail the characteristics of the seasons on Earth and give the correct causes of them;
- Explain how we know that the Earth is spherical and that it is orbiting the Sun;
- Explain in detail why the Moon has phases;
- Give a brief outline of the persons in the historical development of astronomy;
- Explain the meaning of energy, and have an understanding of light and its importance to astronomy;
- Explain how the Sun and other stars shine;
- Discuss the various types of stars and explain how they form and evolve with time;
- Explain what galaxies are, and our place in the Milky Way;
- Explain how large and how old the Universe is, and give the currently favored scientific theory for the origin and ultimate fate of it.

Relation to Other Courses: This course satisfies the General Education requirement outlined in Part A (Natural Sciences and Quantitative Reasoning), Section 1 (Physical Sciences). A related class is ASTR 109 (Astronomy Laboratory). Although concurrent enrollment is encouraged, ASTR 101 can be taken without taking ASTR 109.
Enrollment Information

Prerequisites: The only prerequisite is student interest; there are no college-level prerequisites required. However, some basic mathematical skills are useful, such as:

- The use of the metric system.
- The use of scientific notation, as in $M = 2 \times 10^{33}$ grams.
- The use of simple relations such as $y = 1/x^2$.

The use of mathematics will be kept to a minimum, and in most cases is not needed for a basic understanding of the concepts. However, in some cases a quantitative understanding is as important as a qualitative understanding. We will review the mathematical concepts as we go along.

Adding/Dropping Procedures: Add codes are available upon request starting January 23, 2014. The last day to add or drop the class or change the grading basis is February 4, 2014.

Statement for Students with Disabilities: If you are a student with a disability and believe you will need accommodations for this class, it is your responsibility to contact Student Disability Services at (619) 594-6473. To avoid any delay in the receipt of your accommodations, you should contact Student Disability Services as soon as possible. Please note that accommodations are not retroactive, and that I cannot provide accommodations based upon disability until I have received an accommodation letter from Student Disability Services. Your cooperation is appreciated.

Course Materials


Options for Accessing Course Materials: The publisher has options to obtain electronic access to the text.

Course Structure and Conduct

Style of the Course: This course will be a traditional lecture course. The subjects covered will include:

- Chapter 1 (Discovering the Night Sky), patterns of stars, seasons, phases of the moon (2 weeks);
- Chapter 2 (Gravitation and the Motion of the Planets), Scientific Method, A brief history of Astronomy, Kepler’s and Newton’s Laws, Formation of the Solar System, Comparative Planetology (1.5 weeks);
- Chapter 3 (Light and Telescopes), The Nature of light, optics and telescopes, spectra (1.5 weeks);
- Chapter 4 (Formation of the Solar System) (0.5 weeks);
- Chapter 5 (The Terrestrial Planets and Their Moons), Earth’s atmosphere, interior, The nature of the Moon, tides, formation of the Moon, Terrestrial planets (1 week);
- Chapter 6 (The Outer Planets and Their Moons), Jovian planets (1 week);
- Chapter 7 (Dwarf Planets and Small Solar System Bodies), Asteroids, comets (0.5 weeks);
- Chapter 8 (The Sun: Our Extraordinary Ordinary Star), Solar atmosphere, interior, nuclear fusion (1.5 weeks);
• Chapter 9 (Characterizing Stars), Stellar distances, stellar properties (2 weeks);

• Chapter 10 (The Lives of Stars), Star formation, the main sequence, star clusters (2 weeks);

• Chapter 11 (The Deaths Remnants of Stars), White dwarfs, neutron stars, black holes (1 week);

• Chapter 12 (The Galaxies), The Milky Way (0.5 weeks).

**Individual and Group Activities Required:** There will be weekly reading assignments, with the associated review questions. Approximately 10 times during the semester I will assign a review question that is to be answered in written form and turned in. The homework will be due at the start of class, and will be announced one week in advance. The homework will be graded as follows: 10 points for good, 8 points for OK, 4 points for barely acceptable, 0 points for not acceptable or not turned in. Late homework (after the due date) will not be accepted. *The homework score will be computed from the four highest grades, and will count for 10% of the overall course grade (40 points). Apart from “bonus questions” on the exams, there will be no opportunities for written extra credit.*

**Technology Utilized in the Course:** Class notes that are in electronic form will be made available via Blackboard.

**Course Assessment and Grading**

**Exam Dates:** There will be two intra-term exams. The first midterm exam will be held on **Thursday, February 20, 2014 at 11:00.** The second midterm exam will be held on **Thursday, March 27, 2014 at 11:00.** The dates of these exams will not change except under extreme circumstances. **The final exam will take place Tuesday, May 13, 2014 at 10:30.** *As per University regulations, the time of the final exam cannot be changed under any circumstances.* Please review the rules regarding final exams at [http://arweb.sdsu.edu/es/registrar/finalexams/13_fall.html](http://arweb.sdsu.edu/es/registrar/finalexams/13_fall.html) and in the 2013-2014 General Catalog, page 474. The exams will be closed-book. The exams will be typically be multiple-choice, and will also contain short-answer questions. There will also be a few more difficult “bonus questions” where you can earn extra points.

**Scored Activities and Weighting by Percentage of Total Score:** There will be two intra-term exams. Each score will count 25% of the class grade (100 points each). The final exam will be comprehensive and will count for 35% of the grade (140 points). The homework will count for 10% of the grade (40 points), and attendance will count for 5% of the grade (20 points).

**Grading Scale:** Please review the definitions of letter grades and the SDSU policies regarding grades on page 472-473 of the 2013-2014 General Catalog. The final course letter grade will be based on the following scale:

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<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>90%—100%</td>
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<tr>
<td>A-</td>
<td>85%—89%</td>
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<tr>
<td>B+</td>
<td>80%—84%</td>
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<tr>
<td>B</td>
<td>75%—79%</td>
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<tr>
<td>B-</td>
<td>70%—74%</td>
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<tr>
<td>C+</td>
<td>65%—69%</td>
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<td>C</td>
<td>60%—64%</td>
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<td>C-</td>
<td>50%—59%</td>
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<td>D</td>
<td>40%—49%</td>
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<tr>
<td>F</td>
<td>0%—39%</td>
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</table>

The boundaries for the grades *may* be lowered at the discretion of the instructor. However, the boundaries will *not* be raised. In some cases, I may raise your grade by up to one mark (e.g., C- to C; B+ to A-, etc.) based on such subjective criteria as my sense of your overall enthusiasm for the class and course material. This can be demonstrated in many ways, including “class participation,” attendance, coming to office hours,
evidence of effort and dedication, and so forth. Note that giving the sense that you are an engaged listener is considered to be just as important as actively contributing to the discussion. Although our class is large, questions during lecture are encouraged—don’t be afraid to put your hand up if something has confused you. Finally, note that I will never lower a grade that you have earned—your enthusiasm can only help you.

If you are taking the course with the “credit/no-credit” option, you need a C or above to earn the credit (see pages 472-473 of the 2013-2014 General Catalog). An incomplete grade (“I”) for the course will only be given in cases involving serious medical or legal issues. The entire responsibility for arranging to make up the lost work lies with the student.

Excused Absence Make-up Policies: In the case of missed exams, make-ups will only be considered under the most extreme circumstances may consist of an essay test.

**Other Course Policies**

**Attendance Policy:** I strongly encourage you to come to class, since you will find that it is much easier to do well in the course if you come to the lectures. Although the general outline of the course will more or less follow the textbook, some parts of the book will be emphasized more than others. Also, many lectures will contain supplemental material not found in the textbook.

To further encourage class attendance and participation, I will hand out sign-in sheets after certain lectures. The dates will not be announced in advance, and I will do this between 10 and 20 times in the semester. You can earn up to 20 points for the attendance component, based the fraction of classes attended:

- 80%—100% attendance 20 points
- 60%—79% attendance 16 points
- 40%—59% attendance 12 points
- 20%—39% attendance 8 points
- 10%—19% attendance 4 points
- 1%—9% attendance 1 point
- no attendance 0 points

Note there are 27 lectures this semester not counting the two days we have exams (see below). The two exam days will not be included in the attendance component.

Please note: Signing another person’s name on the attendance sheets constitutes fraud. If this happens, the guilty parties will receive automatic F’s for the course and will be referred to the Judicial Procedures Office.

**Classroom Etiquette:** I expect that the students will maintain a professional atmosphere and show respect to their fellow students.

In particular, the following is prohibited in the classroom:

- Cell phones, laptop computers and similar devices (please turn them off!).
- The reading of newspapers, magazines, etc.
- Talking above a whisper.
- Eating or drinking anything noisy.

*Any form of behavior deemed to be inappropriate by the instructor will not be tolerated. A student will be advised once by the instructor that his/her behavior is inappropriate. The first time this inappropriate behavior is repeated, the matter will be turned over to the University’s Judicial Procedures Office for appropriate disciplinary action.*
Statement of Plagiarism:

Cheating in any form, which includes plagiarism (see page 483 of the University’s 2013-2014 General Catalog for a definition), is a grave offense. Cheating will not be tolerated, and evidence of cheating by a student will result in an automatic “F” as that student’s grade. Any evidence of cheating will be promptly reported to the Judicial Procedures Office.

Safety Issues

The CSU takes the issue of classroom and campus safety very seriously. The office of Business and Financial Affairs has set up a web site where SDSU staff, faculty, and students can find information about San Diego State University’s emergency preparedness plan and opportunities for training on many aspects of the classroom/workplace. See http://bfa.sdsu.edu/emergency/.

In particular, please note the following:

Campus Safety:

- Be aware of your surroundings.
- If you see something suspicious, report it!
- If you have an emergency, call 911 from any phone on campus.
- Other incidents, call Campus Dispatch at 4-1911.
- In the evening, call Campus Escort if you would like an escort to your vehicle or campus dorm.

Classroom Safety

- If there is an emergency, stay calm, and follow the procedure in the flip book.
- Follow the Evacuation Route if you need to evacuate. We evacuate to Scripps Park, and a roll call will occur there. Please show up at the evacuation area since your absence from roll call could cause resources to be used that could be used to help others who may actually be in trouble.
- “Shelter in place” is usually called when a person that is carrying a weapon on campus has become violent and has injured others, or is threatening to injure others. Lock the door from outsiders, only open to the Department Safety Officer, PDS, or other officials of the University.

Note that during any emergency, students should not use their cell phones. The lines of communication are critical to keep open for emergency information. Only Staff and Faculty should keep their cell phones on, and only receive calls if the situation calls for it.