ASTR 201
The Sun and its Planets

Spring 2015   **TR 10:00-11:15AM**   **Sears 480**

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Website: http://astroweb.case.edu/ssm/astr201/
The syllabus, all assignements, homework, etc. are posted on the course website. Check frequently for updates and schedule changes.

Textbook: *Cosmic Perspective - Solar System* (7th edition)
by Bennett, Donahue, Schneider, & Voit.
Be sure to take the homework questions from the right edition of the text
A copy of the Seventh edition is on reserve in the Astornomy Library (Sears 556).

Course Description

An overview of the solar system; the planets and other objects that orbit about the Sun and the Sun itself as the dominant mass and the most important source of energy in the solar system. Concepts and the development of our knowledge will be emphasized. Not available for credit to astronomy majors.
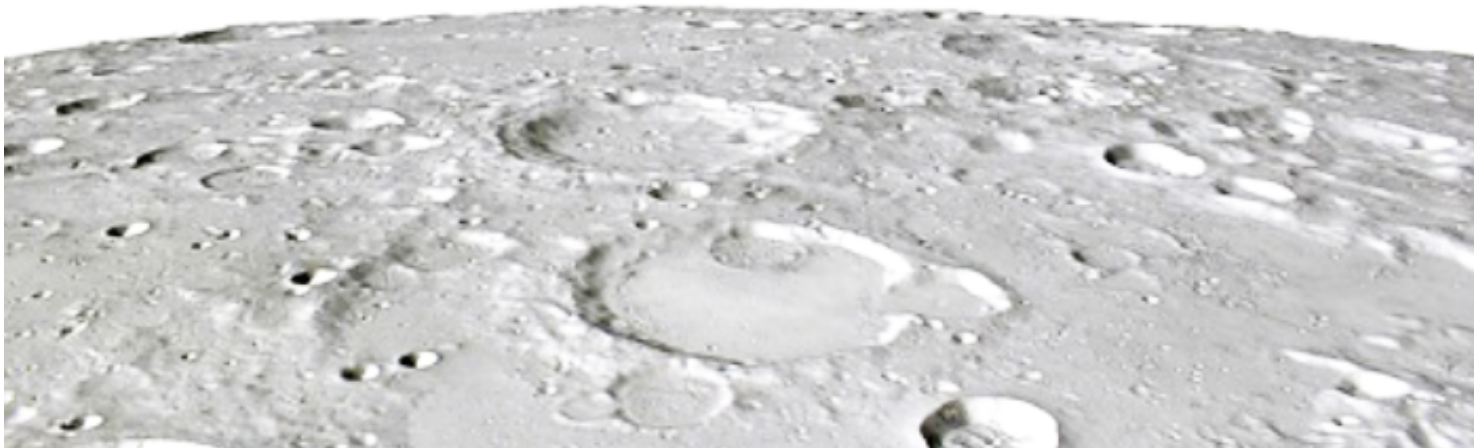
ASTR 201 LECTURE SCHEDULE

Date	Lecture Topic	Reading	Work Due
Jan. 13	Introduction; Cosmic Scale	Chapter 1; App. C	
Jan. 15	Scientific Method	Chapter 3	
Jan. 20	Seasons and the Appearance of the Sky	Chapter 2	
Jan. 22	Lunar Phases & Eclipses	Chapter 2	
Jan. 27	Competing Cosmologies	Chapter 3	HW#1 DUE
Jan. 29	Kepler's Laws	Chapter 3	
Feb. 3	Gravity & the Laws of Motion	Chapter 4	
Feb. 5	Tides	Chapter 4	
Feb. 10	Light: Electromagnetic Radiation	Chapter 5	HW#2 DUE
Feb. 12	Spectra & Telescopes	Chapter 6	
Feb. 17	**EXAM I**	Chapters 1-6	Exam Day
Feb. 19	Formation of the Solar System	Chapter 7, 8	
Feb. 24	Terrestrial Planets: Geology I	Chapter 9	
Feb. 26	Terrestrial Planets: Geology II	Chapter 9	HW#3 DUE
Mar. 3	Terrestrial Planets: Geology III	Chapter 9	
Mar. 5	Terrestrial Planets: Atmospheres I	Chapter 10	
Mar. 9-12	SPRING BREAK	———	
Mar. 17	Terrestrial Planets: Atmospheres II	Chapter 10	
Mar. 19	Terrestrial Planets: Atmospheres III	Chapter 10	HW#4 DUE
Mar. 24	Jovian Planets	Chapter 11	
Mar. 26	Moons of the Solar System	Chapter 11	
Mar. 31	**EXAM II**	Chapters 7-9, 1-6	Exam Day
Apr. 2	Dwarf Planets	Chapter 12	
Apr. 7	Asteroids	Chapter 12	
Apr. 9	Comets	Chapter 12	HW#5 DUE
Apr. 14	Exoplanets I	Chapter 13	
Apr. 16	Exoplanets II	Chapter 13	
Apr. 21	The Sun	Chapter 14	
Apr. 23	Life in the Universe	Chapter 24	HW#6 DUE
May 6	**FINAL EXAM** (12:30-3:30pm)	All of the above	Exam Day

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Grading

Grades are based on a point scale with different assignments weighted as shown in the table. The points are distributed across a variety of exercises so that no single thing will dominate your grade. However, this also means that it is imperative that you complete all assignments. We will drop the lowest homework, but zeros on multiple homeworks fail to add up in a big way.

ASSIGNMENT	Homeworks	Exam I	Exam II	Final	Total
POINTS	175	75	100	150	500

Letter grades will be assigned based upon your cumulative score. Here is how your grade will be determined from your point total in the class:

Letter Grade	Course Total	Percentage
A	450-500	90%-100%
B	400-449	80%-89%
C	350-399	70%-79%
D	275-349	55%-69%
F	0-274	0%-54%

The point scale makes it possible for everyone in the class to do well. For example, if everyone scores above 90% in the course, you would all receive A's. On the other hand, if no one does this will, I may adjust the number of points required to get a given grade. Any adjustment will make it easier to get a given grade, never more difficult (i.e., any curve that is applied can only benefit your grade).

ASTR 201 Assignments

Homeworks

Assignment	Points	Due Date
Homework #1	35	Tuesday, Jan. 27
Homework #2	35	Tuesday, Feb. 10
Homework #3	35	Thursday, Feb. 26
Homework #4	35	Thursday, Mar. 19
Homework #5	35	Thursday, Apr. 9
Homework #6	35	Thursday, Apr. 23

There are 6 homeworks with 7 problems worth 5 points each, plus one extra credit problem for each homework assignment. We will drop your lowest homework score so that your grade will be based on the best 5 out of 6 homework assignments. *There will be no make-ups nor other form of extra credit*.

All homeworks are due at the *beginning* of lecture on the date specified. Homeworks are late (and suffer a 5 point penalty) after lecture begins. The end of lecture is the last opportunity to turn in homeworks with a 5 point late penalty. After that, homeworks will no longer be accepted.

Always put your name on your homework. Be sure to type or write neatly - we can not give credit for things we can not read. For things like multiple choice questions, it is necessary to demonstrate understanding. *Succinctly* explain *why* the answer you chose is correct. It isn't good enough to get the right answer; you need to understand *why* it is the right answer.

Exams

Exam	Points	Date	Time	Place
Exam I	75	Tuesday, Feb. 17	10:00-11:15am	Sears 480
Exam II	100	Tuesday, Mar. 31	10:00-10:45am	Sears 480
Final Exam	150	Wednesday, May 6	12:30-3:30pm	Sears 480

Midterm Exams

There will be two in-class examinations during the semester as noted above. These exams are closed book with no notes, calculators, cell phones, ipods, or implants allowed. Each exam will consist of multiple choice questions, essay questions, and problem solving questions. Just your brain and the writing instrument of your choice. If for whatever reason, the University is *officially* closed on the exam date, the exam date shifts to the next lecture date.

Final Exam

The final exam is cumulative; it will cover *all* material discussed in this course. Some extra emphasis will be given covered after the second midterm. The final will include multiple choice, essay, and problem solving questions, greatly resembling a longer version of the midterms.

Missed Exams

The first rule of missing exams is:
DON'T

If you are not able to take an exam due to illness or some other legitimate reason and you wish to take a make-up exam, you **must**

1. contact me (by voice or e-mail) **before** you miss the regularly-scheduled exam and
2. document a valid excuse for your absence.

Make-up exams must be taken promptly. Note that in the case of the final exam, there is an extremely narrow window before final grades must be submitted.

ASTR 201
HOMEWORK ASSIGNMENTS

Homework problems are assigned from the 7th edition of the textbook *The Cosmic Perspective - The Solar System*.
Be sure you are doing the right homework problems! Other editions of the text will have different questions.

All homeworks are due at the *beginning* of lecture on the date specified.

Remember to put your name on your homework! Be sure to type or write neatly - we can not give credit for things we can not read.

Homework #1 (25 Points) Due Tuesday Jan. 27

Chapter	Problems	Extra Credit
Chapter 1	9, 42, 46	5
Chapter 2	7, 12, 14, 53	———

Homework #2 (25 Points) Due Tuesday Feb. 10

Chapter	Problems	Extra Credit
Chapter 3	9, 43, 45, 50	———
Chapter 4	4, 13, 51	see below

Extra Credit: At what speed must a baseball be thrown to have a kinetic energy equivalent to a one Megaton H-bomb? (see Table 4.1) Express your answer as a fraction of the speed of light. The mass of a baseball is 145 grams. You may ignore relatvistic corrections.

Homework #3 (25 Points) Due Thursday Feb. 26

Chapter	Problems	Extra Credit
Chapter 5	5, 15, 52	———
Chapter 6	5	———
Chapter 7	44	———
Chapter 8	2, 6	47

Homework #4 (25 Points) Due Thursday Mar. 19

Chapter	Problems	Extra Credit
Chapter 9	1, 2, 9, 11	———
Chapter 10	18, 19, 48	see below

Extra Credit: Refer to Mathematical Insight 10.1 in the textbook to do this problem. Using the information provided there, and in the table here, calculate the temperature the Earth would have without an atmosphere. Repeat the exercise for the Moon. By this calculation, which object should be warmer? Why?

Object	Temp.	Albedo
Earth	287 K	0.39
Moon	271 K	0.12

How does your calculation compare to the tabulated average temperature? Why is there a difference?

Given that the Earth and Moon share the same orbit, so receive the same amount of energy per unit area from the sun, does this shed any light on claims that the sun is responsible for climate change on Earth?

(The temperature of the Moon has not changed noticably in the decades since Apollo.)

Homework #5 (25 Points) Due Thursday Apr. 9

Chapter	Problems	Extra Credit
Chapter 11	2, 3, 10, 15	45
Chapter 12	7, 12, 41	———

Homework #6 (25 Points) Due Thursday Apr. 23

Chapter	Problems	Extra Credit
Chapter 13	11, 44, 49, 53	———
Chapter 14	6, 7, 9	50