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ASTR 131.01: Elementary Astronomy I

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Astronomy 131
Elementary Astronomy I
Fall 2001

Tuesday and Thursday, 9:40 - 11:00 a.m. in ULH 101

INSTRUCTOR: Diane Friend *dsfriend@selway.umt.edu*
SC 129 (inside the Physics/Astronomy Dept. office)

PHONE: 243-4299

OFFICE HOURS: Mon. 9-10, Tues. noon-1, Wed. 4-5, Thurs. 3-4, Fri. 1-2
If you can't make the regularly scheduled office hours,
please feel free to make an appointment.

TEXT: *Universe*, 6th edition, by Freedman and Kaufmann
includes CD with Starry Night software

WEB SITE: www.physics.umt.edu/astr131/

Course Description

By the time you finish this course, you should

- know how to find your way around the night sky,
- know something about both the theories and techniques that have enabled us to better understand the planetary system in which we live,
- have become acquainted with the beauty and uniqueness of each major body in the solar system, as well as some of the minor ones.

You will have had a chance to see deep-sky objects through a telescope, use astronomical software to model celestial events, and ponder the possibilities of life beyond earth. You will have had a chance to think about your sense of place and scale in both distance and time.

Please come prepared to be involved! You are welcome to interrupt me at any time with questions, or comments. DO NOT let the size of this class deter you from initiating discussion!! Also, if you would like to pursue any questions you might have in a more informal one-on-one with me, please do not hesitate to come see me during office hours.

Additional astronomical observing opportunities:

The Blue Mountain Observatory will hold public star parties (weather permitting) on Friday, September 14 and Friday, September 21. All are welcome! Observing begins about an hour after sunset. Please call 243-4299 BEFORE you come to check on weather closures. Cancellations hold for the entire night- regardless of changing conditions after they are made!!!

I will also try to have at least one observing open house here on campus this Fall. This is a good opportunity for you to use a telescope and see first hand many of the things that we will talk about during the first couple weeks of the course.

Grading

Your grade for this course will be broken down in the following way:

midterm 1	25%
midterm 2	25%
final (<u>comprehensive</u>)	25%
homework	25%

EXAMS: There will be three exams for this course: two midterms, and a comprehensive final. I will have optional (probably late afternoon, or evening) review sessions before each of these. Exams may contain anything from multiple choice questions, to short answer questions, quantitative questions, or questions relating to in-class demonstrations, videos, or photos. I will post a comprehensive outline of the material covered on the website prior to each exam.

HOMEWORK: There will be five homework assignments due at two to three week intervals throughout the course. DO NOT put these off until the last minute! The assignments will be fairly involved, are a major part of your grade, and will require some exploration on your part. I hope that these assignments will encourage you to go beyond what is specifically discussed in class. Homework should be turned in to the Physics/Astronomy office by 5:00 p.m. on the date due. Homework turned in after 5:00 p.m. will be returned with a grade of zero.

MAKE_UPS, LATE POLICY, etc.: The only make-ups allowed for a missed homework or exam will be for a major emergency, illness, or business trip with verifiable written documentation. I must receive notification on or before the day the homework is due or the exam will be held. It will be much easier to make arrangements for you if I know about your absence ahead of time. Make-ups may be either written, or oral, at my discretion.

ADD/DROPS: The last day to add/drop by Dial Bear or Cyber Bear is Monday, September 24. The last day to drop without petition is Monday, October 15. The last day to change your grading option in this class to pass/no pass is Monday, October 15.

Computers

Astronomical software and/or an internet link will be required on many homework assignments. A scaled-down version of Starry Night (a night sky simulation program) can be found on the CD-ROM included with your text. This is a fun and very useful program. I encourage you to load it on your personal computer and explore what it can do!

The homework assignments can be downloaded from the website. The files are in Adobe Acrobat form and can be read with the Adobe Acrobat Reader which is available as a free download from the link provided. If you do not have your own computer, Adobe Acrobat is available in most of the computer labs on campus.

Course Outline

<u>Date</u>	<u>topics</u>	<u>readings</u>	
Sept.	4	introduction to the course; the night sky	Ch. 1
	6	stars and constellations	2-2, 2-3, 19-3
	11	Finding your way around: astronomical coordinates	2-4, Box 2-1
	13	Motions in the sky: the ecliptic, the seasons	2-5 through 2-8
		Friday, Sept. 14: First homework assignment due	
	18	The Moon's orbit and phases, eclipses	Ch. 3
	20	early astronomical ideas, archaeoastronomy	2-1
	25	astrology, the origin of astronomy, the scientific method	1-1, page 42
	27	Evolution of ideas concerning our place in the universe	4-1 through 4-5
		Friday, Sept. 28: Second homework assignment due	
Oct.	2	Newton, gravity and orbits	4-6 through 4-8
	4	MIDTERM I	
	9	the nature of light	Ch. 5
	11	telescopes	Ch. 6
	16	modern observational tools and techniques	
	18	origin of planetary systems	7-1 through 7-8
		Friday, Oct 19: Third homework assignment due	
	23	overview of known planetary systems	7-9
	25	life in the universe, the search for life beyond Earth	Ch. 30
	30	Earth, our reference point for planetary studies	Ch. 8
Nov.	1	cratering in the solar system, Earth's Moon	Ch. 9
		Friday, Nov 2: Fourth homework assignment due	
	6	the Moon, Mercury	Ch. 10
	8	MIDTERM II	
	13	Venus	Ch. 11
	15	Mars	Ch. 12
	20	the gas giants, Jupiter	Ch. 13
	22	THANKSGIVING	
	27	large moons of the gas giants: surprises and possibilities	Ch. 14, 15-8, 15-9, 16-7, 16-8
	29	Saturn and planetary ring systems	Ch. 15
Dec.	4	Uranus and Neptune	16-1 through 16-6
	6	Pluto, Charon, and other Kuiper Belt Objects	16-9 through 16-10
		Friday, Dec. 7: Fifth homework assignment due	
	11	asteroids and meteors	17-1 through 17-6
	13	the Oort cloud, comets, cosmic catastrophes	17-7 through 17-9
	18	FINAL Tuesday, 10:10-12:10	