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ASTR 131.01: Elementary Astronomy I

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The University Of Montana

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ASTRONOMY 131 - ELEMENTARY ASTRONOMY I
Fall 2000

Meets Tuesdays and Thursdays 9:40 - 11:00 in ULH 101

INSTRUCTOR: David Friend (email: dbfriend@selway.umt.edu)

Office: SC 127 (inside 126), ext. 5283 (Physics/Astron. Department: ext. 2073)

Office Hours: Monday 1:10 - 2:00

Tuesday and Thursday 11:10 - 12:00

Wednesday 9:10 - 10:00 (and other times if you can catch me)

Friday 2:10 - 3:00

Weekly help session: to be arranged

TEXT: *Universe*, 5th edition, by Kaufmann and Freedman (includes CD with Starry Night planetarium software)

WEB SITE: <http://www.physics.umt.edu/astr131/index-astr131.html>

COURSE CONTENT AND GRADING:

This course is an introduction to three major aspects of astronomy: 1) the night sky as we observe it from Earth, 2) the tools of the astronomer, and 3) the nature of the solar system. (Stars and galaxies are covered in Astronomy 132.) The topics that we will cover (and the readings in the text) are spelled out in the outline on page 3. We will spend a lot of class time exploring different topics, either as a whole class, or sometimes in smaller groups, rather than just having me lecture to you. I want to make this course oriented more toward exploration and discovery rather than just the imparting of facts and information. During class I will also be showing a number of videos, films, slides, demonstrations, and web sites, and we will often discuss them afterward. If you are looking for a science course that you can pass by just listening or reading and memorizing, then you are in the wrong course. The only math you need to know for this course is basic high school algebra and geometry. We will do some math problems, but they will not be the major focus of the course. Even though this is a very large class, I would like it to be as informal as possible. Please feel free to interrupt me and ask questions during class.

STUDY GROUPS: For homework assignments you can work in study groups of up to 3 people. These will be established during the first week or two of the course. Study groups might want to sit together during class so members can confer with each other. To form a study group you just need to give me a piece of paper with the names of everyone in the study group, and each person must sign their name too. Study groups of one are OK; if I don't receive a study group list with your name on it, I will assume that you will be working alone. To avoid having some people use the study groups as a way of getting others to do the work for them, on each homework assignment each member of the study group must sign their name to get credit for it. I will keep a folder with a copy of everyone's signature in it and we will check signatures to make sure no one is covering for anyone else.

HOMEWORK ASSIGNMENTS: There will be 6 homework assignments, which are included in the faculty pack for the course. All of the assignments will involve some mathematical problems as well as qualitative questions. The first 3 assignments involve some observing of the sky, but if you can't get out to see the real sky at night, you can complete these assignments using Starry Night. A single assignment will be turned in by each group. Late assignments will only be accepted with a valid excuse, since I will post answers to them.

EXAMS: We will have three major exams, including the final, and the final will not be comprehensive. Make-up exams will only be given when I am notified of a conflict or illness on the day of the exam or before. The exams will contain only multiple choice questions; you will need to bring a scantron sheet to each of the exams. Exam questions will be mostly based on what you learn in class, and not specifically from the textbook. The emphasis on exams will be on understanding rather than just knowing the facts. My multiple-choice questions are well known for being subtle (some would even say tricky!). You may not use your books or notes on the exams.

WEEKLY HELP SESSIONS: One afternoon a week (time to be determined) I will have a help session for anyone who is interested. We can go over the current homework assignment, review for exams, discuss difficult concepts, talk about astronomy in the news, answer any questions you have, and maybe even visit the planetarium. I can only do this once a week, so I hope we can find a time which works for most people who are interested.

ROOFTOP OBSERVING SESSIONS: On three evenings our rooftop observing deck will be open for observing (if it is clear). This would be a good time to get familiar with the night sky, look through some fairly large telescopes, and have a chance to talk more informally about astronomy. The dates for the observing sessions are Thursday, September 21st, Tuesday, October 17th, and Thursday, October 26th. They will be from 9:00 to roughly 10:30. Note: if the weather is uncertain, call my office (243-5283) in the evening, and I will have a message on my answering machine about whether the observing session will be held.

FIELD TRIP TO THE BLUE MOUNTAIN OBSERVATORY?: If the Forests open up again, one evening during the fall we will have an optional field trip to the University's Blue Mountain Observatory. I am tentatively planning for Friday, October 6th. I will make a final decision and specific arrangements later.

WEB SITE: The course web site will have an outline of the lectures for each day. These outlines will appear the day before each lecture, so you can print them out and bring them to class if you want. The site will also have interesting astronomy links, a copy of the syllabus, answers to the practice exam questions, and answers to the actual exam questions (after the exam, of course).

GRADING: Final grades will be calculated according to these percentages:

first exam	25%
second exam	25%
third exam	25%
homework assignments	25%

COURSE OUTLINE

date	topic	reading in text
Sep. 5	introduction to the course; a tour of the cosmos	ch. 1
7	the process of science; astronomy vs. astrology	box 1-3, ch.2 essay
12	the night sky; stars and constellations	2-1, 2-2, box 2-1
14	the celestial sphere; coordinates and magnitudes	2-4, box 2-2, 19-3
19	the Sun's motion: the ecliptic; the seasons *first assignment due*	2-3, 2-5 to 2-8
21	the Moon's orbit: lunar phases and eclipses *first observing session* *last day to add/drop via Dial Bear on 25th*	3-1 to 3-5, box 3-2
26	early astronomical ideas: our place in the universe	3-6, 4-1, 4-2
28	Kepler's laws of planetary motion	4-3, 4-4, box 4-2
Oct. 3	Newton's laws: gravity and orbits *second assignment due*	4-5 to 4-7, box 4-3
5	FIRST EXAM	
10	the nature of light; the electromagnetic spectrum	5-1, 5-2, 6-1
12	optical telescopes *last day to drop or change grading option on 16th*	6-1 to 6-3, box 6-1
17	other types of telescopes; astronomy from space *second observing session*	6-4 to 6-7
19	the structure of the solar system *third assignment due*	7-1 to 7-5
24	the formation of the solar system	7-7 to 7-9, box 7-1
26	Earth: a basis for comparative planetology *last observing session*	8-2 to 8-6
31	the Moon: our nearest neighbor	9-1 to 9-5
Nov. 2	comparing the Moon and Mercury *fourth assignment due*	9-6, ch. 10
7	ELECTION DAY HOLIDAY	
9	SECOND EXAM	
14	comparing the Earth and Venus	11-1 to 11-6
16	comparing the Earth and Mars	12-1 to 12-6
21	life on Mars?; introducing the Jovian planets	12-7 to 12-10
23	THANKSGIVING HOLIDAY	
28	Jupiter and its large moons *fifth assignment due*	13-1 to 13-6, ch. 14
30	Saturn and planetary ring systems	14-8, ch. 15
Dec. 5	Uranus, Neptune, and Pluto	ch. 16
7	meteorites and asteroids: rocks in space	17-1 to 17-6
12	comets and cosmic catastrophes	17-7 to 17-9, box 17-3
14	the possibility of extraterrestrial life *sixth assignment due*	ch. 30
21	THIRD EXAM (10:10 - 12:10)	