Astronomy 134: Fall 2013
Elementary Astronomy Laboratory I

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Office: CHCB 129
Office Hours: Tues. 1-3 and Thurs. 2-3
General help sessions Wed. noon – 1 in CHCB 13
If you cannot make these times, please do contact me to make an appointment for a different time.

Required Supplies: A calculator capable of doing scientific notation.
Lab exercises: Either on Moodle, or available in the course Lab Manual.

Course site: Moodle
All course announcements, many of your labs, links, and grades will be available through the course Moodle site. Check this site often. It is your responsibility to keep up to date with postings on this site, look through any background material listed, and come to each class with a hardcopy of the current week’s lab.

COURSE CONTENT

This course will give you an introduction to some of the METHODS astronomers use to study planetary systems. You will have a chance to see planets and deep-sky objects through a telescope, use modern computer software to explore the sky and model planetary motions, and gain a working knowledge of some of the many techniques astronomers use to study planetary systems- both our own, and the hundreds of other systems that have been discovered around distant stars.

By the time you finish this course you should
• know how to find your way around the night sky
• know where and how to look up information on any object in the sky you are curious about
• be able to observe, model, and predict the motions of celestial objects and understand why they appear to move the way they do
• have gained a fundamental knowledge of how astronomers use the properties of light to understand distant objects
• understand the role of gravity in the motion of planetary bodies
• have a working knowledge of basic telescope optics and know how to determine fundamental
OBSEVING

Weather and fires permitting, we will begin the semester with a number of evening observing sessions. These labs are really fun and provide a great opportunity for you to get familiar with the Fall night sky. Sign-ups can be found on Moodle. Please sign up as early as possible for your favorite times. If you have a legitimate conflict with all possible nights for a given lab, please discuss alternatives with your instructor.

We also have two public open house nights scheduled at the Blue Mountain Observatory during the start of the semester.

**Blue Mountain Observatory Open House Nights**

Friday Aug. 30 and Friday, Sept. 6

Be sure to call 243-5179 the night of observing if there is any question about the weather before you drive all the way up the mountain! For more information about the Observatory, directions, and a map, go to [cas.umt.edu/physics/bluemountain/](http://cas.umt.edu/physics/bluemountain/).

**Course Expectations**

The labs will usually expand on material presented in Astronomy 131, so it is important that you attend the lectures and keep up with any readings or activities in that class before coming to lab. Most past students of the lab have found that the more in-depth, practical experience of the laboratory course really helps their understanding of the material presented in the lecture.

Throughout the course you will be expected to:

1. Read through the experiments (at least the introductory material in them) and complete any pre-lab reading required before coming to class. Make sure you understand the material from the lecture which relates to the lab.
2. Ask questions. Come prepared to enter into discussion. Try to ask questions that help you focus on the big picture, not just procedural details.
3. Do your own work. Even when you collaborate with other people in the lab, your lab write-up must reflect what you understand. I reserve the right to assign zero credit to students I suspect of copying or relying on the work of others. The zero score may be replaced with a full credit grade by scheduling an oral interview which will cover the concepts of that particular lab. If you can convince me that you understand the material, I will grade you on the work you turned in.

**In short, always practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. If you have not read through the material at the following link, do so now!**

GRADING

The course consists of 14 labs. Each lab has equal weight. 20% of your lab score each week will come from your quiz grade, 80% from your lab write-up. Lab write-ups are due at the end of each lab period. Labs will be graded and returned the following week. There will be no quiz the first week of class or at observing labs. I will drop your lowest lab score at the end of the semester. This gives a total of 130 points for the course. Plan on grades being assigned based on the traditional grading curve: 90-100% A, 80-89% B, 70-79% C, etc..

Note on missed labs:
Because you can drop your lowest lab score, there will be NO make-up labs. You can miss any one lab for any reason. If you complete all labs, you get to drop your lowest grade. If you know ahead of time that you will have to miss a lab for a legitimate reason, please get in touch. There is often the possibility that I can fit you into another lab section that week. If you have a prolonged illness or emergency with appropriate documentation, definitely come see me and I will do my best to help you out.

EQUAL ACCESS: A fair and inclusive learning environment benefits us all. I encourage students from different cultural backgrounds, students for whom English is not their native language, and/or any student who has a disability that may adversely affect their academic performance to contact me within the first few days of class to discuss appropriate accommodations. If you think you may have a disability and have not registered with DSS, please contact them in Lommasson 154, call (406) 243-2243, or view the DSS website at http://life.umt.edu/dss. The folks at DSS are very helpful!

ADD/DROPS: The last day to add/drop on Cyber Bear is Monday, Sept. 16. The last day to drop with your instructor's and advisor's signature, is Monday, Oct. 28. A drop, or change of grading option after Monday, Nov. 2 requires the signature of the Dean and written documentation of exceptional circumstances. Doing poorly in the class does not constitute adequate reason to drop the class at the end of the semester!

What's happening in the night sky-
We will post announcements of any especially interesting or unusual night sky events on Moodle.

Moon phases this semester
New moon: Sept. 5, Oct. 5, Nov. 3, Dec. 3
Full moon: Sept. 19, Oct. 18, Nov. 17, Dec. 17

Meteor showers
Orionids: night of Oct. 21
Leonids: night of Nov. 16
Geminids: night of Dec. 12/13
# Astronomy 134 - Fall 2013 Lab Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Experiment</th>
<th>Location</th>
<th>Time</th>
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| 1    | Aug. 29,30| Introduction to the Course  
What’s up in the night sky / Planetarium  
Star Charts  
Please sign up for ONE 1.5 hour time slot for next weeks Night Observing lab. | CHCB 229  |                           |
| 2    | Sept. 3,4,5  
Backup Dates:  
Sept. 8,9,10 | Observing the Night Sky  
Sign up for the Lunar Observing Lab!  
Begin out of class observations for Phases of the Moon Lab after Sept. 6. | Skaggs Observing Deck  | 9-10:30 p.m. or 10:30-midnight |
|      | Sept. 5,6  | Star Maps                                                                   | CHCB 229  |                           |
| 3    | Sept. 12,13 | Seasons                                                                    | CHCB 229  |                           |
| 4    | Sept. 15,16,17  
Backup Dates:  
Oct. 14,15,16 | Lunar Observing                                                            | Skaggs Observing Deck  | 8:00-9:30 pm or 9:30-11 p.m.  
7:30-9 or 9-10:30 for backup dates |
|      | Sept. 19,20 | Phases of the Moon                                                          | CHCB 229  |                           |
| 5    | Sept. 26,27 | Gravity and Orbital Motion                                                  | CHCB 229  |                           |
| 6    | Oct. 3,4   | Radial Velocity and Exoplanets*                                             | CHCB 229  |                           |
| 7    | Oct. 10,11 | Spectroscopy*                                                               | CHCB 229  |                           |
| 8    | Oct. 17,18 | Lenses and Image Formation                                                 | CHCB 229  |                           |
| 9    | Oct. 24,25 | Bulk Density and Planet Composition*                                       | CHCB 229  |                           |
| 10   | Oct. 31, Nov. 1 | NO LAB                                        | CHCB 229  |                           |
| 11   | Nov. 7,8   | Solar Energy and the Habitable Zone*                                        | CHCB 229  |                           |
| 12   | Nov. 14,15 | The Surface of Mars                                                        | CHCB 229  |                           |
| 13   | Nov. 21,22 | Exoplanet Transits*                                                        | CHCB 229  |                           |
| 14   | Nov. 28,29 | THANKSGIVING HOLIDAY                                                       | CHCB 229  |                           |