Astronomy 134: Fall 2014

Elementary Astronomy Laboratory I

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Phone: 243-4299
Office: CHCB 129
Office Hours: General help sessions Tues. noon – 1 in CHCB 13
Tues. 1-3 and Thurs. 2-3 in CHCB 129
If you cannot make these times, please do contact me. I am happy to make appointments for alternate times.

Required Supplies: A calculator capable of doing scientific notation.
Lab Manual: Pearson Custom Astronomy Labs, available at the UC Bookstore
Other lab exercises: available on course Moodle site (no cost)

Course site: Moodle
All course announcements, many of your labs, links, and grades will be available through the course Moodle sites. Check the Moodle 134 common area 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. There will be a 10% reduction in your weekly grade if you do not bring a printed copy of the lab. Course grades will be listed in a separate, section specific site.

ASTRONOMICAL OBSERVING

Weather 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.

Blue Mountain Observatory Public Observing Night

We also have one remaining public open house night scheduled for the Blue Mountain Observatory on Sept. 19. FREE tickets can be reserved through the Blue Mountain Observatory website, listed below. The open house will be cancelled if the weather is bad, so if there is any doubt, be sure to call 243-4299 the night of observing BEFORE you drive all the way up the mountain! For more information about the Observatory, directions, a map, and a link to Eventbrite for ticket reservations, check the Blue Mountain Observatory website:

http://cas.umt.edu/physics/Blue_Mountain_Observatory.
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 properties such as light gathering power, magnification, and resolution
- be able to explain how basic planet properties relate to planet mass and distance from star
- have a working knowledge of the methods astronomers use to discover and characterize the properties of distant exoplanets
- have gained experience with some of the techniques that have enabled us to discover some amazing things about the universe we live in!

Specific, detailed learning objectives for each laboratory exercise are given at the beginning of each lab write-up.

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! http://life.umt.edu/vpsa/student_conduct.php.
The course consists of 13 labs. Your grade for each lab (with the exception of the two observing labs and our visit to UM’s brand new planetarium) will consist of two parts. 60% of your grade will be based on the satisfactory completion of your weekly lab in class. I will not be grading these in detail, just checking to see if they are complete and spot checking some of the more difficult questions. I will make a lab key available to you once I have checked your lab for completion and we can go over any problems you had questions on. You should also feel free to come see me outside of class if you have additional questions. The remaining 40% of your grade will be based on a weekly Moodle quiz that will test your understanding of the material presented in the lab. Each quiz will be open from the time of your lab until the end of the following week. Answers to quiz questions will be available once the quiz has closed. The observing and planetarium labs will have no quiz, so your “quiz” score for that week will be the same percentage that you earned on the lab. I will grade your observing lab write-ups and your planetarium lab grade will be based on attendance.

Each lab has equal weight. I will drop your lowest lab and quiz score at the end of the semester. 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 and quiz score, there will be NO make-up labs. You can miss any one lab for any reason. If you complete all labs and quizzes, you get to drop your lowest lab and quiz grades. If you know ahead of time that you will have to miss a lab for a legitimate reason, please get in touch. I may be able to 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 www.umt.edu/dss. The folks at DSS are very helpful!

ADD/DROPS: The last day to add/drop on Cyber Bear is Monday, Sept. 15. The last day to drop with your instructor's and advisor's signature, is Monday, Oct. 27. 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-
I will post announcements of any especially interesting or unusual night sky events on Moodle.

Moon phases this semester
Full moon:  Sept. 8, Oct. 8, Nov. 6, Dec. 6

Meteor showers
Orionids:  night of Oct. 21
Leonids:  night of Nov. 17
Geminids:  night of Dec. 13
<table>
<thead>
<tr>
<th>Week</th>
<th>Dates</th>
<th>Experiment</th>
<th>Location</th>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Aug. 28,29</td>
<td>Introduction to the Course Exploring the Night Sky: Sky Simulation Programs 1. Please sign up on Moodle for ONE 1 hour time slot for next weeks Lunar Observing lab. 2. Make at least 3 lunar observations over the next 2 weeks to bring to class for the Phases of the Moon Lab.</td>
<td>CHCB 229</td>
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<td>2</td>
<td>Sept. 2,3</td>
<td>Lunar Observing</td>
<td>Skaggs Observing Deck</td>
<td>8:30-9:30 p.m. OR 9:30-10:30 p.m. OR 7:45-8:45 p.m. OR 8:45-9:45 p.m. for backup dates</td>
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<td>Backup Dates: Sept. 30, Oct. 1</td>
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<td>Sept. 4,5</td>
<td>Phases of the Moon</td>
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<td>3</td>
<td>Sept. 11,12</td>
<td>Eclipses</td>
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<td>4</td>
<td>Sept. 16,17</td>
<td>Observing the Night Sky</td>
<td>Skaggs Observing Deck</td>
<td>8:30-10:00 p.m. OR 10:00-11:30 p.m. OR 8:15-9:45 p.m. OR 9:45-11:15 p.m. for backup dates</td>
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<td>Backup Dates: Sept. 23, 24</td>
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<td>Sept. 18,19</td>
<td>Planetarium</td>
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<td>Sept. 25,26</td>
<td>Gravity and Orbital Motion*</td>
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<td>6</td>
<td>Oct. 2,3</td>
<td>NO LAB</td>
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<td>7</td>
<td>Oct. 9,10</td>
<td>Spectral Analysis</td>
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<td>8</td>
<td>Oct. 16,17</td>
<td>Lenses and Image Formation</td>
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<td>9</td>
<td>Oct. 23,24</td>
<td>Extrasolar Planets</td>
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<td>10</td>
<td>Oct. 30,31</td>
<td>Photometry and Exoplanets*</td>
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<td>11</td>
<td>Nov. 6,7</td>
<td>NO LAB</td>
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<td>12</td>
<td>Nov. 13,14</td>
<td>Solar Energy and the Habitable Zone*</td>
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<td>13</td>
<td>Nov. 20,21</td>
<td>The Surface of Mars</td>
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<td>14</td>
<td>Nov. 27,28</td>
<td>THANKSGIVING HOLIDAY</td>
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<td>15</td>
<td>Dec. 4,5</td>
<td>NO LAB</td>
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* Part of a course lab pack available in the UC Bookstore. (All other labs will be available for free on Moodle.)