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ASTR 135N.00: Elementary Astronomy Laboratory II

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Astronomy 135
ELEMENTARY ASTRONOMY LABORATORY II
Course Syllabus - Spring 2014

INSTRUCTOR: Diane Friend
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PHONE: 243-4299
OFFICE: CHCB 129 (inside the Physics/Astronomy dept. office)

OFFICE HOURS: M 10-11 & 1-2, W 10-11 & 3-4, Th noon-1
Please feel free to stop by or make an appointment for other times.

Required supplies: You will need a calculator capable of doing scientific notation and a small flashlight or headlamp for the nighttime observing.

Moodle:

You have TWO Moodle listings for Astronomy 135.

Astronomy 135 Common Area
Important course announcements, some lab exercises, and very useful links and resources will be posted on Moodle in the Astronomy 135 Common Area. You will need to check the Common Area every week before lab to make sure you are up to date on the activities and resources for that week.

Section specific Moodle shell
All of your lab grades will be posted in the Moodle shell for your specific lab section.

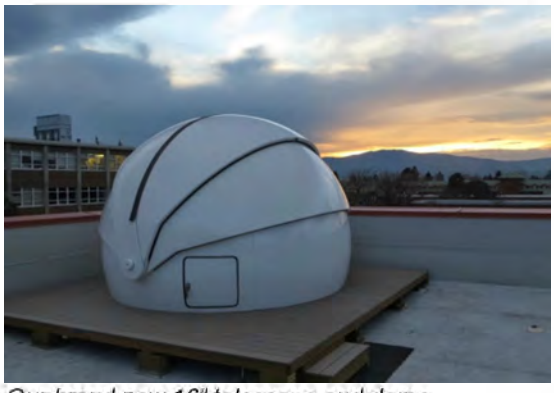
Labs:

Astronomy Labs: A Concept Oriented Approach, Nate McCrady/Emily Rice

This is a Pearson custom lab pack that will be available through the UC Bookstore. It will probably not be available until the second or third week of classes. Because this is a custom lab pack that contains only the labs you will need, the cost will be quite low. I will let you know when it is available to purchase.

There will also be a few labs that are NOT in the lab pack. These will be free and available for download in the Astronomy 135 Common Area.

IMPORTANT: You **MUST** bring a hardcopy of each week's lab to class with you. There will be a standard 10% reduction in your weekly lab grade if you come to class without the write-up.


Our brand new 16" telescope and dome
Skaggs Observing Deck

Astronomical Observing

Observing the universe personally is an experience not to be missed! Even on campus, a clear, dark Montana night will yield spectacular views of star clusters, nebulas, and galaxies. I would like everyone in the class to have a chance to observe.

We will start the semester with a visit to our Starlab Planetarium to do some stargazing and get you familiar with what is currently up in the night sky. Although Spring semester weather in Missoula is notoriously cloudy, we will try to have one formal observing lab later in the Spring, and hopefully, some informal observing opportunities where you can bring your friends and/or family members to our Skaggs rooftop observatory.

Course Content

This course will give you an introduction to some of the METHODS astronomers use to study the universe. You will have a chance to see deep-sky objects through a telescope, use modern computer software to explore deep-sky objects, analyze astronomical data, and discover HOW astronomers gather information about the stars, the galaxy in which we live, and the universe at large.

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
- have gained a fundamental knowledge of the properties of light and the information that can be gleaned from it
- understand the role of gravity in the motion of celestial objects and the evolution of structure in the universe
- understand the basic nature of stars (including our Sun) and how they evolve over time
- know the basic characteristics of our home galaxy, the Milky Way
- understand how galaxies can differ from one another, how they evolve over time, and what they can tell us about the evolution of the universe
- 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 132, 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 greatly 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 that 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. 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.

   IMPORTANT: Specifically, in this course, academic honesty means that your lab write-up will be your own answers, IN YOUR OWN WORDS. Groups may collaborate on data taking and are encouraged to *discuss* questions and results, but each student is personally responsible for their own write-up and explanations. EVERY student working in a group is expected to be a thinking, questioning, contributing member!

   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 that 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.

QUIZZES

There will be a short, 15 minute quiz at the beginning of most lab periods. Lab dates with no quiz are marked in the course schedule. Questions on the quiz will probe your knowledge of any pre-lab readings (including material previously covered in Astr. 132) and your understanding of essential results from the previous lab. All labs contain a detailed list of learning objectives that will be the focus of questions on each quiz. Quiz scores will comprise approximately 20% of your course grade.

GRADING

The course consists of 14 labs. The first week's lab will not be graded. This leaves 13 labs, or lab/quiz combinations. Every week is weighted equally, with 80% of your grade being based on your lab write-up and 20% of your grade based on your quiz. If there is no quiz, 100% of your grade will be based on 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 at the beginning of class (before the quiz). I will drop your lowest lab score and your lowest quiz score at the end of the semester. This leaves a total of 12 weekly grades from which your final course average will be calculated. 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 and one quiz for any reason. If you complete all labs/quizzes, you get to drop your lowest lab/quiz grades. 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 Friday, February 14. The last day to use a Drop/Add form to drop or change grading option, with the signatures of your instructor and advisor is Monday, April 7. A drop, or change of grading option after April 7 requires the signature of the Dean and written documentation of exceptional circumstances.

I will be happy to sign a change of grading option until the last day of classes, but I will NOT sign a drop request after April 7 unless you have documentation of exceptional circumstances.

SPRING LAB SCHEDULE

WEEK	DATES	EXPERIMENT	LOCATION
1 **no quiz**	Jan 29,30	**Course introduction;** **Star Maps / Starlab Planetarium** Please download a night sky app on your smartphone or laptop and bring to class with you. Several are listed under Week 1 in the Astr. 135 common area- along with many other great observing resources.	CHCB 225 For the first hour, then CHCB 13 for the planetarium
2 **no quiz**	Feb 5,6	**Quantitative Reasoning: Exploring Nearby Stars**	CHCB 13
3	Feb 12,13	**Brightness/Distance Relation**	CHCB 13
4	Feb 19,20	**Atomic Spectra**	CHCB 13
4 or 5 **no quiz**	Feb 19,20 Backup dates Feb. 25,26	**Night Sky Observing 7:30-9:30 p.m.** You must sign up for an observing time on Moodle. If your section is cancelled due to weather, sign-up again as soon as possible for one of the make-up dates. For all nighttime observing labs, call 243-4299 one hour before the start of your observing session for an update on sky conditions and whether or not the lab will be held. Do not call more than one hour before the start of your lab as weather can change rapidly and we will not necessarily make a decision prior to that.	Skaggs Roof meet outside east entrance to Skaggs observing session times and sign-ups are posted on Moodle
5	Feb. 26,27	**Atoms and Electrons**	CHCB 13
6	Mar 5,6	**Images and Telescopes**	CHCB 13
7	Mar 12,13	**Exoplanets**	CHCB 13
8	Mar 19,20	**Nuclear Fusion and Energy in Stars**	CHCB 13
9	Mar 26,27	**Star Clusters and the Age of Stars**	CHCB 13
10	Mar 31 - April 4	**SPRING BREAK**	
11	Apr 9,10	**Gravity and Black Holes**	CHCB 13
12 **no quiz**	Apr 16,17	**The Milky Way**	CHCB 13
13	Apr 23,24	**Spiral Galaxies and Dark Matter**	CHCB 13
14	Apr 30, May 1	**Hubble Law and the Expansion of the Universe** (LAST class meeting)	CHCB 13
15	May 7,8	Last week of classes- NO LAB	
16	May 12-16	**Finals week** (Final course grades will be posted on Moodle)	

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:
New moon: Jan. 30, Mar. 1, Mar. 30, Apr. 29
Full moon: Feb. 14, Mar. 16, Apr. 15, May 14

Meteor showers:
Lyrids: peak the night of April 21/22 (active Apr. 16-25)
Eta Aquarids: May 5/6 (active Apr. 19- May 26)