

General Astronomy: Stars & Galaxies
ASTR 1120 – Summer 2010
M-F 11:00AM – 12:35PM – Duane G131
Website: <http://culearn.colorado.edu>

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Office Hours: By appointment (email, or talk before/after class)

COURSE DESCRIPTION: In this course we will attempt to build the Universe from the ground up. We will start with the star that is nearest and dearest to us, the Sun, and progressively expand our scope until we are eventually discussing the nature of the Universe as a whole. Along the way we will work through the details of topics like stellar evolution, galactic structure, the Big Bang Theory. We will discuss what astronomers already understand about these subjects as well as pose questions that still remain partially unanswered. We hope to convince you that the scientific process allows us to discover facts about the universe that cannot be observed in everyday life.

PREREQUISITES: No formal prerequisites, just a natural curiosity about what's out there. ASTR 1120 and 1110 (or 1010) may be taken in either order to satisfy core curriculum non-sequence requirement in natural science. Only ASTR 1020 completes the core natural science two-semester sequence requirement (when taken with 1010, 1110 or 1030). Students may receive credit for only one of ASTR 1020, 1120, or 1040.

GRADING:

- 10% Clicker questions
- 10% Tutorials
- 5% Presentation
- 5% Class Participation
- 20% Homework (written + mastering astronomy)
- 50% Exams (5 total – 10% each – **every Friday**)

REQUIRED TEXT:

The Cosmic Perspective: Star, Galaxies & Cosmology, 5th Ed. by Bennett et al. (required). We will assign regular readings from this book. If you buy an earlier edition, it is your responsibility to make sure assigned reading chapters are the same as in the 5th edition. The Media Update version of the textbook is the same text but comes with an interactive eBook and free planetarium software at no additional charge (neither of which are mandatory for the course but some may find them useful). You may purchase the text in an online only e-book version from masteringastronomy.com

Lecture Tutorials for Introductory Astronomy, 2nd Ed. by Prather et al. (required). This workbook (included free with a new textbook) will be used for in-class, group activities throughout the semester. Although these worksheets will be graded for completion only, you *are* required to understand this material and questions very similar to some worksheet questions will appear on the exams. You will not be given an answer key for these worksheets but can come discuss the solutions in office hours. You must bring this book to class every day.

MASTERING ASTRONOMY: Access to the online material (tutorials, quizzes, etc.) at www.masteringastronomy.com is also required for this class. New textbooks come with an access code for the website. Access to the online material is also available for \$35 for those who purchased a used copy of the text. You should register with our class on that site, using the class ID of **ASTR1120SUMMER2010**, since only then will your work on assignments count for credit. When you register for MasteringAstronomy, **you must use your CULearn logon name when it asks for your Student ID (NOT your CU Student number)**. You can use whatever name you want for your MasteringAstronomy logon name.

EXAMS: There are no makeup exams for any reason (including excused absences). Since a situation may arise which could cause you to miss one of the exams, we will accommodate this by dropping your lowest score. You will be allowed one sheet (both sides) of handwritten notes (8.5" x 11") for each exam.

HOMEWORK: Written homework is due at the *beginning* of class on the day it is scheduled due. Written homework turned in during or after class will be considered late and will not receive credit. Online homework is typically due by 11:00am on the scheduled due date, but you should check the online website to be sure. Partial credit (up to 50%) will be given to online homework submitted after this time. Online homework can be completed up until the start time of the final. Do not abandon online homework just because it is late. Some credit is better than none and you will be in a much better position for the exams.

CLICKERS: Each of you will need to purchase a wireless student response system ("iClicker"). Several times during each class we will ask questions to get you to think carefully about some of the concepts we have covered. Often we will have you talk to your neighbors after you answer on your own, so you can help each other figure out the correct answer.

Use of clickers:

- Improves your grade. When you discuss and debate with others your knowledge improves.
- Gives *YOU* immediate feedback regarding what you do and do not understand.
- Tells *US* what the class does not understand.
- Greatly improves class participation

The only time you will not be held responsible for clicker participation is for excused absences. All other missed clicker questions will count as zero points.

Clickers will be graded as:

0 pts	No answer
1 pt	Wrong answer
2 pts	Right/valid answer

You **must** register your clicker through CUConnect (<http://cuconnect.colorado.edu>). Using someone else's clicker for them is a violation of the Honor Code and both you and the person whose clicker you are operating will receive a zero for the clicker portion of your grade.

TUTORIALS: During the term you will be expected to complete a selection of the Lecture Tutorials that are the most relevant to the course material. The tutorials will generally be done in class, but may occasionally be assigned as homework. You will be graded on the completeness of your work and

engagement in the tutorials during class time. The tutorials are meant to help you learn for the exams and should be seen as one of the best ways to solidify your understanding of the topics.

Tutorials will be graded as:

0 pts	Mostly Incomplete
1 pt	Partially complete, low-quality responses
2 pts	Mostly complete, high-quality responses

CLASS PARTICIPATION: The class participation grade will be based on your involvement in class discussions and your overall activity-level in class. Each Friday after the exam (which will not take the whole class period) we will hold a discussion on general astronomical topics. While we will have some material prepared for these discussions, you are encouraged to bring in your own questions or possible discussion topics.

“APOD” PRESENTATION: Each student will be expected to present on the Astronomy Picture of the Day once during the term. You will be expected to discuss the object pictured and give some background information on it, which can be done from the description and links provided on the APOD web page. Additionally, you will be expected to tie the APOD into a concept that has been discussed in class. Adam and Devin will give an example presentation on the 2nd day of class. We will have a signup sheet to determine which APOD posting you will be responsible for and which day of the term you will be expected to present it.

OPTIONAL NIGHT OBSERVING: There are open house sessions at the Sommers-Bausch Observatory every Friday night. If you show up to one of these sessions and write a brief summary of what you observed, a small amount of ‘bonus’ credit will be awarded. Information about the SBO open houses can be found here: <http://cosmos.colorado.edu/sbo/public/openhouse.html>.

COURSE MATERIAL AND SCHEDULE: The course covers (roughly) the material in Chapters 1,3, 5-7, 15-23 in *Cosmic Perspective*.

WEEK 1:

- Day 1 (July 6th, 2010): Introduction
- Day 2 (July 7th, 2010): Light and Spectra
- Day 3 (July 8th, 2010): Gravity, Motion, and Doppler Shift
- Day 4 (July 9th, 2010): TEST #1 + AstroTalk

WEEK 2:

- Day 5 (July 12th, 2010): Telescopes & Look-back Time
- Day 6 (July 13th, 2010): Parallax & Distance
- Day 7 (July 14th, 2010): The Sun
- Day 8 (July 15th, 2010): Stars and Fusion
- Day 9 (July 16th, 2010): TEST #2 + AstroTalk

WEEK 3:

- Day 10 (July 19th, 2010): Stars: stellar life cycle and the HR diagram
- Day 11 (July 20th, 2010): Stellar death, White Dwarves, Neutron Stars, Black Holes
- Day 12 (July 21st, 2010): The Interstellar Medium
- Day 13 (July 22nd, 2010): Galaxies: The Milky Way
- Day 14 (July 23rd, 2010): TEST #3 + AstroTalk

WEEK 4:

- Day 15 (July 26th, 2010): Galaxies: Others

Day 16 (July 27th, 2010): Galaxies, Clusters, & Dark Matter
Day 17 (July 28th, 2010): Clusters & Large Scale Structure
Day 18 (July 29th, 2010): Large Scale Structure & The Distance Ladder
Day 19 (July 30th, 2010): TEST #4 + AstroTalk

WEEK 5:

Day 20 (August 2nd, 2010): Cosmology & CMB
Day 21 (August 3rd, 2010): Expansion/Fate of the Universe & Dark Energy
Day 22 (August 4th, 2010): Big Bang & Inflation
Day 23 (August 5th, 2010): Spacetime & Relativity
Day 24 (August 6th, 2010): TEST #5 - FINAL

COMMON COURTESY: For the benefit of your fellow students and your instructor, you are expected to practice common courtesy with regard to all course interactions. For example:

- Act as mature and responsible adults at all times.
- Show up to class on time, and be prepared to learn when class starts.
- Do not leave class early and do not start packing up before class is dismissed. We will not extend class past the designated time.
- Please do not use cell phones in class (this includes text messaging).
- Laptop computers may be used in the front three rows *only* (and may only be used for class-related activities).
 - Those students wishing to use their laptop in class will be required to sign a contract committing to use their laptop for class-related activities only.

If you follow these requests, we will practice common courtesy towards you: ending class on time and dealing with you as individuals and as adults.

CU HONOR CODE: All students of the University of Colorado at Boulder are responsible for knowing and adhering to the academic integrity policy of this institution. Violations of this policy may include: cheating, use of another student's clicker, plagiarism, aid of academic dishonesty, fabrication, lying, bribery, and threatening behavior. All incidents of academic misconduct shall be reported to the Honor Code Council (honor@colorado.edu; 303-725-2273). Students who are found to be in violation of the academic integrity policy will be subject to both academic sanctions from the faculty member and non-academic sanctions (including but not limited to university probation, suspension, or expulsion). Other information on the Honor Code can be found at: <http://www.colorado.edu/policies/honor.html> and at <http://www.colorado.edu/academics/honorcode/>

While everyone understands what the honor code means on quizzes and exams, there is often confusion on what it means for homework. Students are encouraged to work together on homework, but your write-ups and web submissions must be independent. Copying, whether by hand or cut-and-paste on your computer, constitutes cheating. The best way to ensure you understand the assigned material is to split off from the group when writing up or submitting your answers. Assignments that seem identical will receive split credit. If you copy text or other information from any source for any reason, you must also include a citation to that source. If you use wikipedia, look at the sources cited in the article too. ***When in doubt about plagiarism, paraphrasing, quoting, or collaboration, consult with Devin or Adam.***

CLASSROOM BEHAVIOR: Students and faculty each have responsibility for maintaining an appropriate learning environment. Students who fail to adhere to such behavioral standards may be subject to discipline. Faculty have the professional responsibility to treat all students with understanding, dignity and respect, to guide classroom discussion and to set reasonable limits on the manner in which they and their students express opinions. Professional courtesy and sensitivity are especially important

with respect to individuals and topics dealing with differences of race, culture, religion, politics, sexual orientation, gender, gender variance, and nationalities. We will gladly honor your request to address you by an alternate name. Please advise us of this preference early in the session so that we may make appropriate changes to my records. See full policies at:

<http://www.colorado.edu/policies/classbehavior.html> and at

http://www.colorado.edu/studentaffairs/judicialaffairs/code.html#student_code

STUDENTS WITH DISABILITIES: If you qualify for accommodations because of a disability, please submit a letter from Disability Services so that your needs may be addressed. Letters requesting accommodations must be submitted *at least* two weeks before a test. Disability Services determines accommodations based on documented disabilities (303-492-8671, Willard 322, <http://www.colorado.edu/disabilityservices>).

RELIGIOUS OBSERVANCES: Campus policy regarding religious observances requires that faculty make every effort to reasonably and fairly deal with all students who, because of religious obligations, have conflicts with scheduled exams, assignments or required attendance. In this class, please contact Adam and Devin in advance of the religious observation to make arrangements. See full details at http://www.colorado.edu/policies/fac_relig.html.

DISCRIMINATION & HARASSMENT: The University of Colorado at Boulder policy on Discrimination and Harassment, the University of Colorado policy on Sexual Harassment and the University of Colorado policy on Amorous Relationships apply to all students, staff and faculty. Any student who believes s/he has been the subject of discrimination or harassment based upon race, color, national origin, sex, age, disability, religion, sexual orientation, or veteran status should contact the Office of Discrimination and Harassment (ODH) at 303-492-2127 or the Office of Judicial Affairs at 303-492-5550. Information about the ODH and the campus resources available to assist individuals regarding discrimination or harassment can be obtained at <http://www.colorado.edu/odh>.

QUESTIONS & PROBLEMS: Please don't hesitate to get in touch with Devin or Adam if you have questions about any aspect of the class, or if you start running into difficulties following the material or keeping up with assignments – remember, **we're here to help!**