

ASTR 170 B1 – The Physical Universe - Section 5

Spring 2013

Class meets Tuesday and Thursday: 12:30 PM – 1:45 PM Location: Centennial Hall

Instructor: Prof. Edward Prather, Steward Observatory Room 207
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Office Hours and Teaching Assistant information to be announced.

Course Description

“The Physical Universe” presents the astronomical phenomena of the universe in the context of physical science and examines Newton's laws governing force and motion, the laws of thermodynamics governing temperature and energy, the role of electromagnetism in nature, and the atomic structure of matter, all in the context of current issues in space sciences (3 credits).

Required Text

ASTR 170 B1: The Physical Universe, A Custom Edition for the University of Arizona. This custom book contains *Lecture-Tutorials for Introductory Astronomy, Third Edition*, by Prather, Slater, Adams, and Brissenden, *the course syllabus, as well as other material needed for the course* – **NOTE: BRING YOUR LECTURE-TUTORIAL BOOK TO CLASS EVERYDAY!!**

Instructional Philosophy of the Course

The overarching goals of this course are for you to understand the nature of science through the eyes of astronomy; to help you develop your critical reasoning and complex problem solving skills; to improve your understanding of the big ideas in astronomy; and to develop a lifelong interest in astronomy and current events surrounding astronomy. To meet these four goals, the course instructors have carefully designed a sequence of learning tasks and assessment procedures as outlined on the following pages.

–**Active engagement with group activities occurs daily and is REQUIRED.** Research shows that you can only learn a limited amount of information from lecture alone, no matter how clear or entertaining. Therefore, this course is composed of a series of mini-lectures that will be augmented by collaborative learning activities (Think-Pair-Share questions, Lecture-Tutorials (LT), and Ranking Tasks (RT)). These activities target specific ideas presented during lecture and are designed to be completed in-class by student pairs working collaboratively and coming to consensus on their answers. A significant emphasis of course homework and exams is dedicated to assessing how well students are able to explain their reasoning (both verbally and in writing) to the questions asked in these collaborative learning activities. You will not submit the results of your work after doing these collaborative learning activities for grading. However, since the questions of these activities are similar to the questions on course exams, you will greatly benefit from working outside of class to be sure you fully understanding the answers and their reasoning, so you can consider these activities as “ungraded homework” deserving of a significant amount of out of class study time.

–Participation and Writing is REQUIRED. Since this course is built around daily activities to accompany the lecture, your attendance and full participation at each class period will be an essential component of your success in the course. Periodically we will conduct in-class writings and administer unscheduled questionnaires that will be collected during class. All information about the schedule and content of the writing assignments will be communicated in-class through lecture and in the course power-point slides (available on D2L). You will not be allowed to make up any missed participation points (unless you provide us with a Dean’s Excuse in advance of missing class). Therefore, to allow for the unavoidable periodic absences, which naturally arise during the semester, without heavily penalizing your overall course grade, **we will calculate your end of the semester participation and writing grade based on the following points/grading scheme:**

- 80% or more of participation and writing points – A
- 70% - 79% of participation and writing points – B
- 60% - 69% of participation and writing points – C
- 50% - 59% of participation and writing points – D
- 49% or less of participation and writing points – E

NOTE: YOU DO NOT NEED TO NOTIFY US WHEN YOU ARE ABSENT FROM CLASS (unless you will be using a Dean’s Excuse).

–Periodic homework is REQUIRED. – A large number of Homework Problem Sets will be posted to the online course management website “Desire to Learn” or “D2L”. The purpose of these Homework Problem Sets is to help you strengthen your understanding of course material and help you prepare for exams. The content of EVERY Homework Problem Set will be emphasized on the corresponding exam — as a result it is expected that you will work through ALL of the problems in sequence with the flow of content presented in the course (see the “In Class Activity Schedule” below). For the homework portion of your overall class grade, you are required to turn in 10 completed Homework Problem Sets (which you believe best represent your understanding of the course content). You will submit these 10 Problem sets in a binder/folder with Your Name and Student ID number CLEARLY written on BOTH the BINDER/FOLDER and EACH of the 10 Problem Sets. **The deadline to submit your Homework Binder/Folder is Tuesday, April 30th, in class.** You may turn your Homework Binder/Folder before this date as long as it contains 10 completed Problem Sets. **No late Homework will be accepted.**

–Activities Outside of Class are REQUIRED. During the semester you are required to participate in an evening of observing the night sky at the Steward Observatory public telescope **located in the courtyard of the Steward Observatory building on campus.** Observing times are available Monday – Thursday evenings starting at approximately 7:00 PM. You are required to sign up for your observing time before going to the telescope using the observing roster/sign-up sheets located in the main floor (lobby) of the Steward Observatory building. Bring the *Observing Log* that is attached to the end of the syllabus with you to the observatory. You must have the Observing Log stamped by the Telescope Operator. See further details written on the Observing Log for more information on what to draw and what to write to complete your Observing Log. Note: Steward Observatory is only open at night, it cannot operate when it is cloudy, and there is a set number of people who can sign up for any given timeslot. Therefore, we recommend that you sign up early in the semester. Although we recommend that you submit your Observing Log very soon after completing your night of observing, they will also be accepted through **Tuesday April 30th (In Class).** **No late Observing Logs will be accepted for ANY reason past Thursday April 30th.**

Grading Scheme

Absolute grading (no curves, no competition, and **absolutely no extra credit** - it is in your best interest to help each other learn astronomy)

- | | |
|---------------------------------------|-----|
| 1. Three Exams (<i>drop lowest</i>) | 40% |
| 2. Final Exam (<i>cannot drop</i>) | 15% |
| 3. Homework | 15% |
| 4. Participation and Writing | 25% |
| 5. Observatory Visit/Log | 5% |

90% – 100%	A
80% – 89.9%	B
70% – 79.9%	C
60% – 69.9%	D
≤59.9%	E

No plus or minus grades

Your course grades can be accessed via D2L. Course grades will not be posted anywhere other than on the D2L site. If you find a mistake with your grade listing, please contact your course TA as soon as possible. **It is your responsibility to discover and notify your TA of any errors.**

All grades in the class are final 72 hours after they have been posted and/or the assignment or Scantron forms have been returned. Please make sure if you have any grading dispute that you contact your TA BEFORE this 72 hour period is over.

Exams and Testing Circumstances

There will be three course exams during the semester, and one cumulative Final Exam at the end of the semester. The dates listed as “exam days” in this syllabus for the in-term exams (not including the final) are proposed dates, and they have not been finalized. You will be notified about in-term exam locations, dates and times through both in class communications, in course power point slides, and on announcements posted on D2L. These exams will take place outside of the normally scheduled class time. We will finalize the times of each exam as early as possible. **Please do not make any plans that interfere with exams times once they have been scheduled, as there are no late or make-up exams given.** If you need to miss an exam, you will **not** be allowed to make up this exam (unless you have a **prior approved Dean’s Excuse**). Rather, as we only count your best two out of three in-term exam scores toward your overall course grade, it will be this missed exam that we drop as your lowest score. You **cannot** be excused from the **final exam** and there are no opportunities to take it at a different time. The University has scheduled the time for the class final exam and this is the only time it is to be offered. During these closed-book, closed-note exams, you **must bring a photo ID**, you are not allowed to wear headphones, or allowed to communicate with anyone in the classroom except for the course instructors and exam proctors. If you have been certified as needing to take an exam under special circumstances, please make the necessary arrangements with the Disabilities Resource Services Center well in advance of the exam date (at least 10 days). You are required to bring a pencil with you to all exams.

Course Conduct

**COME TO CLASS READY TO PAY ATTENTION AND WORK COLLABORATIVELY EVERYDAY!!
YOU WILL NOT BE ALLOWED TO USE YOUR CELL PHONE OR LAPTOP DURING CLASS.
RESPECT YOUR FELLOW CLASSMATES AND THEIR LEARNING!!!**

If your cell phone is visible, OR you choose to use your laptop for any purpose other than note taking, OR your behavior is disruptive to the learning of other students during the class, you will be asked to provide your Student ID Number and you will lose one day of participation points. **If your behavior is in violation of this course conduct policy more than twice during the semester, you will FAIL THE CLASS.** For safety reasons we ask that you **do not leave class early unless you have talked to the instructor or a TA in advance.** We consider academic dishonesty, including cheating, plagiarism, and fabrication, as defined in the *U of A Code of Academic Integrity*, to be a serious offense and the maximum punishments allowed will be pursued in all scenarios. This includes completing any homework assignments or scantron forms for another student. **If nearly (or totally) identical work is submitted by more than one student, all parties involved may receive the maximum punishment allowed for plagiarism and/or cheating. Make your work your own, be original.**

<u>Dates</u>	<u>In-Class Activity Schedule</u>
1/10	Introduction, Syllabus
1/14 – 1/18	Seasons LT Newton's Laws and Gravity LT
1/22 – 1/25	EM Spectrum LT Telescopes and Earth's Atmosphere LT
1/28 – 2/1	Luminosity, Temperature and Size LT Blackbody Radiation LT
2/4 – 2/8	EXAM #1 Types of Spectra LT Atoms and Light LT
2/11 – 2/15	Analyzing Spectra LT Doppler Shift LT
2/18 – 2/22	Sun Size LT Greenhouse Effect LT
2/25 – 3/1	Formation of the Solar System LT Apparent and Absolute Magnitudes LT
3/4 – 3/8	EXAM #2 H-R Diagram LT
3/11 – 3/15	No Classes: Spring Break
3/18 – 3/22	Stellar Formation and Lifetimes LT Stellar Evolution LT
3/25 – 3/29	Extrasolar Planets LT Milky Way Scales LT
4/1 – 4/5	Galaxy Classification LT Size and Scale RT
4/9 – 4/12	EXAM #3 Looking at Distant Objects LT
4/15 – 4/19	Dark Matter LT Expansion of the Universe LT
4/22 – 4/26	Cosmology LTs
4/29 – 4/30	Wrap up Cosmology Observing Logs Due Tuesday April 30th (In Class) Homework Portfolio Due Tuesday April 30th (In Class) LAST DAY of Class Tuesday April 30th
5/8 (Wednesday) 1:00 p.m. - 3:00 p.m.	FINAL EXAM Wednesday May 8th. Here in Centennial Hall

Do not make travel arrangements that conflict with this Final Exam.

Exams are NOT given early.

ASTR 170 B1 Observing Log

Telescope Operator Stamp

Name: _____

Student ID: _____

Observing Date: _____

Drawing(s) of what you observed	

Use the space below AND the back of this page to provide a detailed description of the objects you viewed (as if you were describing what the objects looked like to a person that had their eyes closed). Include the time of your observation, the direction you were looking, important names and labels. Describe the appearance of the objects, including how they may have looked different than your expectations.

ASTR 170 B1 – The Physical Universe
SPRING 2013 STUDENT INFORMATION AND AGREEMENT SHEET

Name _____

Student ID Number _____

Local Telephone Number _____

Email Address (*if checked regularly*) _____

By signing below, I acknowledge I understand that:

- (a) The policies, rules, regulations, dates and deadlines outlined within this course syllabus apply in all ways directly to me and my conduct in the course.
- (b) This course has scheduled midterm examinations and a final examination as shown in the syllabus and listed in the University course/examination schedule, and I will not make plans that interfere with these scheduled examinations. In addition, I will bring my photo-student ID and a pencil to each examination and show my photo-student ID to a test administrator if asked.

Signature

Date

Model Release Form:

I grant permission to The Arizona Board of Regents, on behalf of The University of Arizona and its agents or employees, to use photographs or videos taken of me on the date and at the location listed below for publication in university publications such as recruiting brochures, newsletters, and magazines, and to use the photographs on display boards, websites, and to offer them for publications in other non-university newspapers, magazines and websites, without notifying me.

I hereby waive any right to inspect or approve the finished photographs, videos, or printed matter that may be used in conjunction with them now or in the future, whether that use is known to me or unknown.

I hereby agree to release, defend, and hold harmless the Arizona Board of Regents, on behalf of The University of Arizona and its agents or employees, including any firm publishing and/or distributing the finished product in whole or in part, from and against any claims, damages or liability arising from or related to the use of the photographs or videos, including but not limited to any misuse, distortion, blurring, alteration, optical illusion, or in the taking, processing, reduction or production of the finished product, its publication or distribution.

I am at least 18 years of age and I am competent to contract in my own name. I have read this release before signing below, and I fully understand the contents, meaning and impact of this release. I understand that I am free to address any specific questions regarding this release by submitting those questions in writing prior to signing, and I agree that my failure to do so will be interpreted as a free and knowledge acceptance of the terms of this release.

Centennial Hall and Room N210 of Steward Observatory

Location of Photo or video

Spring Semester 2013

Duration of Photo taking or video taping

Name (please print)

Signature

Date

Signature of guardian if under 18 years of age