

ASTR121: Introductory Astrophysics II — Stars and Beyond

Spring 2003

Lectures:	Tuesday, Thursday 11h00–12h15, CSS 2428		
Discussion Section:	Friday 13h00–13h50, CSS 2428		
Labs:	Monday 11h00–13h00, CSS 1109 (section 0201) Monday 14h00–16h00, CSS 1109 (section 0101)		
Homepage:	http://www.astro.umd.edu/~dcr/Courses/ASTR121		
Professor:	Dr. Derek Richardson		
Office:	CSS 1249		
Phone:	301-405-8786		
E-mail:	astr121@astro.umd.edu		
Office Hours:	After class most days, by appointment, or drop by		
Teaching Assistants:	John Vernaleo (0201)	Stacy Teng (0101)	Huaning Li
Office:	CSS 0202	CSS 0228	CSS 0252
Phone:	301-405-8523	301-405-1566	301-405-1545
E-mail:	vernaleo@astro.umd.edu	stacyt@astro.umd.edu	hli@astro.umd.edu
Office Hours:	Tu 14h-15h; W 11h-12h	Tu 14h-15h; W 15h-16h	M 15h-16h; W 15h-16h
Required Text:	Freedman & Kaufmann, <i>Universe</i> , 6th Edition (2002)		

Introduction

This course presents a broad introduction to the science of astronomy. It is designed to be a two-semester sequence with the first semester (ASTR120) concentrating on our Solar System and the second semester (ASTR121) concentrating on our Galaxy and the Universe. The intent of the course is to give the student a solid background in the primary physical concepts relevant to astronomy, and a broad exposure to the astronomical universe. **This course is for science majors, or those with a strong interest in science.**

In addition to learning about our Universe, a primary goal of this class is to develop your scientific thinking and problem-solving abilities. **Equations and numerical calculations will be a component of this class.** A working knowledge of algebra and geometry (but not calculus) is *essential* for this class.

Course Structure

This course consists of two lectures, one discussion period, and one two-hour lab session each week. The lectures will contain the bulk of the course material and provide a forum for general questions. It is intended that the lectures parallel the text. Thus, for a better understanding of the lecture material, it is important that you READ THE TEXT (preferably BEFORE the lecture). However, some material in the lectures may not be in the text. You are responsible for all material presented in class, discussion periods, labs, and the homework, even if it is not in the text.

The discussion periods serve a variety of roles. Primarily, they provide an opportunity to think about and apply the lecture material. They also are a forum for question-and-answer sessions, problem-solving practice sessions, and group discussions of issues brought up in the lectures. You are **expected** to attend discussion section. Most of the time there will be graded work to be done in the discussion period, which will count

towards your overall grade in this course. You will need a *valid* excuse to make up any work missed in discussion section (see below).

The lab class is centered around hands-on written and computer exercises demonstrating concepts relevant to various areas of astronomy. There is a separate syllabus for the lab. We will hand out photocopies of the lab exercises; there is no required lab text.

Be Prepared

Students are expected to bring a pen or pencil, paper, and a calculator to every class, discussion, and lab. Generally you do not need to bring your textbook (you will be notified in advance otherwise). Remember, in-class quizzes can occur at any time...

Night Lab

We will be going to the Campus Observatory to look at the night sky and to use optical telescopes. This night session will require your presence on campus one night during the semester, most likely in March or April. Since we cannot predict the weather, we may have several unsuccessful attempts at night observing. Realistically, it often takes 2–3 scheduling attempts before we get a clear night. Given the size of the class, there will be two night labs, with roughly one half of the class assigned to attend one or the other night lab. We will announce later in the term the available dates, and you will be given an opportunity to select your preference. You must have a *valid* written excuse if you miss your chosen night lab in order to make up the work.

Grading

Your final grade will be based on class work (including discussion section worksheets), homework, lab work (including the night lab), two mid-term exams, and the final exam. These factors will be combined in the following percentages to determine your class grade:

25% weight on class work, homework, and the night lab;

15% on lab exercises;

25% on the mid-term exams;

35% on the final exam.

The following grading scale will be used for final grades:

A	90–100%
B	80–89%
C	68–79%
D	55–67%
F	< 55%

Note that the optional $+/-$ grading scale will NOT be used in this course.

There will be no curve on the final grades. There may need to be some adjustment to scores depending on the class average; however, any adjustment will be to lower the percentages given above, never to raise them.

The mid-term exams are scheduled for the dates given on the accompanying class schedule. The first exam will cover all material presented in lecture and discussion up to that point. The second exam will cover all

subsequent material not covered in the first exam. The exams will occur during the regular class lecture hour in the same room.

Homework will be assigned most weeks and is to be turned in at the beginning of class on the designated day. Homework turned in after the beginning of class on the due date will be considered late. Late homework may be turned in up to 1 week after the due date, at a penalty of 20% reduction in score. After one week, we will return graded homework and hand out solution sets; no homework is accepted after that. It is expected that each homework assignment will take 2–3 hours to complete if you are attending lecture and are up to date on your reading of the text. Homework must be neat, readable, and stapled if necessary, with all work shown, justification given for answers as required, and with the units in all quantitative questions clearly indicated. Marks will be deducted for failing to adhere to these requirements. At times, written work will be given to be completed during class, which will be graded, and should also be neat, etc. Some of these exercises may involve the use of equipment; others may involve problem solving in groups.

The final exam will be a cumulative exam drawing on all material covered by the lecture, discussion, and labs. The final will be given at the time, and in the room, listed in the University Schedule of Classes (also see bottom of accompanying class schedule).

Finally, please note the grading structure of this class makes it mathematically impossible to get an ‘A’ grade for the course without doing reasonably well on the homework and class work. Typically students who do not do homework seldom get better than a ‘C’ course grade and often get a ‘D’ grade or worse; don’t count on being the exception.

Missed Exams

The University recognizes only a few excuses for missing exams, including religious holidays, University-approved travel, and illness (Cf. Schedule of Classes, p. 36). None of the exams are scheduled on major recognized religious holidays. Except in the case of emergencies, you will know beforehand if you will miss a scheduled exam or lab. If you provide a *valid written* excuse BEFORE the exam, a make-up exam will be given at a mutually agreed upon time. In the case of emergencies, you must contact me *promptly* following the missed exam with a *valid written* excuse in order to be able to take a make-up exam. Make-up exams may be written or oral, at my discretion. If you do not have a valid written excuse, you will NOT be allowed to make up the exam.

If you miss the final exam, a *valid written* excuse must be provided within TWO DAYS after the missed final exam. In addition, you must arrange with me a time for a make-up exam within two days after the exam date listed in the University course schedule. This is fixed because course grades are due 48 hours after the final exam has been held.

If you miss in-class work, you must present a valid excuse the next time that you are able to attend class. We will make arrangements for you to make up the work.

Due to the nature of the labs, we also apply the University rules for excuses to missed labs. You must have a written excuse and should inform the TA, or myself, immediately if you are going to miss a lab. We will have a couple of lab makeup days at the end of the semester. Only those who presented their excuses at the time of the missed labs will be able to make up labs during these sessions.

For the night labs, it may not be possible for everyone to attend on their assigned night. If that is the case for you, please be sure that we are aware *in advance* that you will be unable to attend. We will make arrangements for you to make up the work.

The Honor System

The academic community at the University works on the basis of a Code of Academic Integrity (Cf. Schedule of Classes, p. 36). Acts of academic dishonesty include cheating, fabrication, facilitating academic dishonesty,

and plagiarism. Specifically, activities such as cheating on exams or labs, copying homework, knowingly permitting your homework to be copied, and submitting forged excuses for absences from exams are violations of this code. All cases of suspected academic dishonesty will be turned over to the Student Honor Council to investigate and resolve. The normal sanction for academic dishonesty is a course grade of 'XF', denoting failure due to academic dishonesty. The Code of Academic Integrity is reprinted in full in the Undergraduate Catalog. **We are serious about this.**

Recently the Student Honor Council proposed and the University Senate approved an Honor Pledge.¹ The University of Maryland Honor Pledge reads:

"I pledge on my honor that I have not given or received any unauthorized assistance on this assignment/examination."

Although not compulsory, you are encouraged to write and/or sign this pledge on the front cover of all papers, projects, or other academic assignments submitted for evaluation in this course.

There are a couple of potential gray areas that naturally arise in this class. For homework, you are permitted to work with other students in the class. This includes discussion of the problem and solution in a cooperative, mutually contributing fashion. However, you should write out your answer in your own words. You should NOT, under any circumstances, simply copy someone else's homework and call that "working together." You should NOT seek out or use "solution sets" from previous students. You may seek help on homework problems from the TA or myself. For labs, it is expected that you will work with your partner or partners, but the written work that you turn in should be in your own words and you should have worked through the equations, and plugged in the numbers yourself. Failure to abide by these rules could result in the case being brought before the Student Honor Council.

If you have questions regarding what is appropriate and what is not, please talk to me.

Students with Special Needs

Students with a documented disability who wish to discuss academic accommodations should contact me as soon as possible.

If you are experiencing difficulties in keeping up with the academic demands of this course, contact the Learning Assistance Service, 2201 Shoemaker Building, 301-314-7693. Their educational counselors can help with time management, reading, note-taking, and exam preparation skills.

If your writing skills could use improvement, check with the campus Writing Center.

¹<http://www.inform.umd.edu/honorpledge/>

ASTR121 Course Outline

No.	Date	Lecture	Chapter
1	Jan. 28	Introduction, Distances	19
2	30	Stellar Motions and Magnitudes	19
3	Feb. 4	Stellar Spectra	19
4	6	Binary Systems and Mass Measurement	19
5	11	Properties of Stars/The H-R Diagram	19
6	13	Powering the Stars	18
7	18	The Interstellar Medium	20
8	20	Stellar Clusters and Star Formation	20,21
9	25	Stellar Evolution I	21
10	27	Stellar Evolution II	22
	Mar. 4	Mid-term Exam	—
11	6	Stellar Remnants: White Dwarfs	22
12	11	Neutron Stars and Pulsars	23
13	13	General Relativity and Black Holes	24
14	18	Structure of Our Galaxy	25
15	20	Motions Within Our Galaxy	25
	25	Spring Break!	—
	27	Spring Break!	—
16	Apr. 1	The Galactic Center/Stellar Populations	25
17	3	Properties of Other Galaxies I	26
18	8	Properties of Other Galaxies II	26
19	10	Hubble's Law and Clusters of Galaxies	26
	15	Mid-term Exam	—
20	17	Superclusters and Active Galaxies	26,27
21	22	Quasars, Lensing, and More	26,27
22	24	Evolution of Galaxies	28
23	29	Cosmology	28
24	May 1	The Expanding Universe	29
25	6	The Early Universe	29
26	8	The Fate of the Universe	28
27	13	Life in the Universe	30

Final Exam: Friday, May 16, 2003, 08h00–10h00, CSS 2428