

Queens College Physics Department

Astronomy II Day **T,F** SB C201 8:50 – 10:05 AM Version 1.2 - 7/24/08
Fall 2008 Lab: **T or F** 10:15 – 12:05

Instructor: Professor F. J. Cadieu (Cadieu@qc.edu)

Text: Jeffrey Bennett, Megan Donahue, Nicholas Schneider, and Mark Voit, The Essential Cosmic Perspective, 4th Ed., Addison Wesley, 2007. Blackboard and www.masteringastronomy.com

Class Days	Subject Topics	Laboratory, Homework and Tests
Part I & II: Astronomy Concepts		
Aug. 29	Chptr. 1, 2 Our Place &	Assignment 1: Introduction and Practice, No Credit
Sept. 2, 5	Chaptr. 2, 3 The Science of Astronomy	
Sept. 9, 12	Chptr. 4 & 5 Light and Matter	Assignment 2
Sept. 16, 19	Chptr. 5 Telescopes: The Tools of Astronomy	Assignment 3
Part IV Stars, Star Lives, Star Death		
Sept. 23, 26	Chptr. 10 Our Star the Sun	Assignment 4
Oct. 3	Chptr. 11 Measuring the Stars	
Oct. 7, 10	Chptr. 12 The Interstellar Medium	Assignment 5
Oct. 17	Chptr. 13 Star Deaths the Seed of Life	Test 1 – Part I, II, & IV, Friday Chptrs. 1-5 & 10-13
Part III: Our Planetary System		
Oct. 21, 24	Chptr. 6 The Solar System	
Oct. 28, 31	Chptr. 7 Earth and Terrestrial Worlds	Assignment 6
Nov. 4, 7	Chptr. 8 The Jovian Planets Chptr. 9 The Remnants	
Part V: Galaxies and Beyond		
Nov. 11, 14	Chptr. 14 The Milky Way Galaxy Chptr. 15 Normal and Active Galaxies	Assignment 7
Nov. 18, 21	Chptr. 16 Hubble's Law & Dark Matter	
Nov. 25	Chptr. 17 Cosmology	
Dec. 2, 5	More Chptr. 16, 17	Assignment 8
Dec. 9, 12	Chptr. 18 Life in the Universe	Test 2- Part II & V, Friday Chptrs. 6-9 & 14-17
Dec. 16	Summary & Final Preparation	
Dec. 17-23	Finals Week, Final Probably Dec. 19	Final – Cumulative

Course Code ID for Mastering Astronomy: AST2DAYF08CADIEU

Introductory Astronomy 2 Day: The Essential Cosmic Perspective

Professor Fred J. Cadieu

Tu, Fr 8:50-10:05 AM, Science Building, Room C201

Office: SB B202. Phone: 718 997-3364, e-mail: Cadieu@qc.edu

Office hours: Tu, Th 1-2 PM

General Information

Astronomy 1 and 2 are general introduction to modern astronomy courses. Astronomy 2 includes a laboratory component and satisfies the Queens College requirement for a science course with a laboratory. The lecture parts of these courses are very similar. No scientific or mathematical background is assumed, beyond the entrance requirements to CUNY. Astronomy is *a science*, however, so you will be expected to develop your critical thinking skills in order to understand and apply the scientific method. In terms of mathematics, we will use only arithmetic and a bit of simple algebra. Credit can be earned for either Astronomy 1 or 2, but not for both. These courses are not designed as a sequence.

Our main point of interest will be the big picture that illustrates our place in the universe. There have many new discoveries over the last decade and particularly since the start of the space age that have changed our view of the universe. New discoveries about our neighboring planets have made comparative planetology an important tool in essentially directing a telescope toward the Earth. This new knowledge gives an appreciation of the Earth as a very special place in our solar system. We will not try to memorize many particulars that used to be a big part of introductory astronomy courses.

As a PLAS course, General Astronomy fulfills an Area of Knowledge and Inquiry requirement by teaching students a natural science and the scientific process: how scientists and mathematicians collect and explain astronomical data, from viewing without instrumentation to observation with optics, spectroscopy, x-ray and gamma rays. The students will appreciate how instruments and theories of science have evolved over time, building on milestone achievements of the past (eg., Newton building on Galileo's work, Einstein's Theory of Relativity leading to the work of Hubble and the Big Bang Theory). Close attention is paid to the process of posing questions in order to keep a theory open to rigorous experimental testing. Students will be engaged to critically think and discuss as active citizens about two modern dialogues in science: (1) the unique role of Earth in the solar system as a habitat for life versus the problem of global climate change; (2) how the birth of nuclear science has led to our understanding of the Sun's energy output, the development of nuclear weapons, and current debate over the control and employment of such weapons or energy sources.

Required Textbooks/Media

The textbook for this course is *The Essential Cosmic Perspective*, fourth edition, by Bennett, Donahue, Schneider, and Voit. You will also need a personal access kit for the MasteringAstronomy website and the *SkyGazer* CD, both of which should have come with your book if you purchased a new copy. (Note: If you purchased a used copy of the book, you must buy access to the website online at www.masteringastronomy.com.)

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Course Requirements and Grading

Astronomy Grading Policies Fall 2008 Semester

The Course Grade will be determined from the following course components.

Two in-class midterm exams with the best score weighted twice as much as the lower score in determining a test average.	38%
On-line homework from www.masteringastronomy.com	37%
In-class attendance & quizzes, weeks 3 to week 14	25%
Lecture Part of Course	100%
Course Final, The Final will be cumulative and will be weighted either at 15% or at 40% which ever results in the higher score for the student.	15% or 40% whichever gives higher score.
Combined Lecture and Final	100%
Combined Lecture and Final Scores	66.7%
Astronomy 2 Laboratory	33.3%
Course	100%

Letter grades are assigned in terms of the normal Queens College grade equivalence.

A+ 97-100	B+ 87-89	C+ 77-79	D+ 67-69
A 93-96	B 83-86	C 73-76	D 60-66
A- 90-92	B- 80-82	C- 70-72	F 0-59

In principle every student can earn an A or even A+, but that goal is usually as elusive as reaching to the edges of the universe.

- Observing sessions: We will have several nights where campus telescopes will be set up for observing the skies. You are encouraged to attend these observing sessions.

Common Courtesy Guidelines

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

- Show up for class on time.
- Turn off your cell phones before class begins!
- Do not leave class early, and do not rustle papers in preparation to leave before class is dismissed.
- Be attentive in class; stay awake, don't read newspapers, etc.
- If you must be late or leave early on any particular day, please inform your instructor or TA in advance.
- Play well with others. Be kind and respectful to your fellow students and your teachers.

You can expect your grade to be lowered if you do not practice common courtesy.

Can I Get the Grade I Really Want?

Yes—but it will depend on your effort. It does not matter whether you have even learned anything about astronomy before or whether you are "good" in science. What does matter is your willingness to work hard. Astronomy is a demanding course, in which we will move quickly and each new topic will build on concepts covered previously. If you fall behind at any time, you will

find it extremely difficult to get caught back up. If you want to get a good grade in this class, be sure to pay special attention to the following:

- Carefully read the section in the Preface of your textbook called "How to Succeed in Your Astronomy Course." It describes how much time you should expect to spend studying outside class and lists a number of useful suggestions about how to study efficiently.
- When you turn in assignments of any kind, make sure they are done clearly and carefully. Refer to the separate handout on "Presenting Homework and Writing Assignments."
- Don't procrastinate. The homework assignments will take you several hours, so if you leave them to the last minute you'll be in trouble—and it will be too late for you to ask for help. Both quizzes and homework need to be completed on time if you want to avoid late penalties.
- Don't miss class, and make sure you come to class prepared, having completed the assignments due by that date.
- Don't be a stranger to your instructor—come see me in office hours, even if you don't have any specific questions.
- If you find yourself confused or falling behind for any reason at any time, let me know immediately! No matter what is causing your difficulty, I am quite willing to work with you to find a way for you to succeed—but I can't help if I don't know there's a problem.

A Closing Promise

All the hard work described above might sound a bit intimidating, but I can make you this promise: Few topics have inspired humans throughout the ages as much as the mysteries of the heavens. This class offers you the opportunity to explore these mysteries in depth, learning both about our tremendous modern understanding of the universe and about the mysteries that remain. If you work hard and learn the material well, this class will be one of the most rewarding classes of your college career.

The laboratory will utilize a combination of astronomy related equipment and telescopes, and some simulated equipment measurements made on computers. Laboratory notes will be distributed at the beginning of each lab period. The computerized experiments are the Virtual Astronomy Laboratory Software Version 3. Queens College has a site license for this software. The virtual astronomy experiments allowed measurements to be made using simulated expensive equipment that would not usually be available to students. The virtual astronomy laboratories are designated by unit numbers. Some astronomy laboratory exercises from *Astronomy Through Practical Investigations* by G. Lomoga, W. Smiley and R. Warasila may be utilized. This part of the course is under revision.

Each experiment is integrated with appropriate exercises to form a project. Each project will take 3 sessions except the Sun & Moon, which will take 1 session each. Ast. 2 Day Labs. Either Tu or Fr, Ast. 2 Eve. Labs. Either Tu or Th

The Laboratory projects will be performed in the order indicated on page 6.

Note that some lab sections have a slightly different order to allow equipment to be setup for the different classes.

Laboratory Classes

1. Attendance at each laboratory class is compulsory.
2. It is intended that students should complete as much as possible of each exercise during the laboratory session. So each laboratory exercise will be collected at 12:00 P.M. (or at 8:15 P.M.) at the end of the laboratory session assigned to that exercise. Exercises will not be accepted after the end of the class.
3. Students should prepare for each lab class by reading the explanations in the exercises and the textbook. A calculator is available in the lab.
4. Leave the lab bench for the next class as you would like to find it! Put the equipment away tidily and remove all garbage after class.

Astronomy 2 Laboratory Schedules Fall 2008

	Ast. 2 Day Tu Lab.	Topic		Ast. 2 Day Fr. Lab.	Topic		Ast. 2 Eve. Tu Lab.	Topic		Ast 2 Eve. Th Lab.	Topic	
Lab. Day 1	Sept. 2	A		Aug. 29	A		Sept. 2	A		Aug. 28	A	
Lab. Day 2	Sept. 9	A		Sept. 5	A		Sept. 9	A		Sept. 4	A	
Lab. Day 3	Sept. 16	A		Sept. 12	A		Sept. 16	A		Sept. 11	A	
Lab. Day 4	Sept. 23	M		Sept. 19	M		Sept. 23	M		Sept. 18	M	
Lab. Day 5	Oct. 7	S		Sept. 26	S		Oct. 7	S		Sept. 25	S	
Lab. Day 6	Oct..21	B		Oct. 3	B		Oct..21	B		Oct. 2	B	
Lab. Day 7	Oct. 28	B		Oct. 10	B		Oct. 28	B		Oct. 16	B	
Lab. Day 8	Nov. 4	B		Oct. 17	B		Nov. 4	B		Oct. 23	B	
Lab. Day 9	Nov. 11	Unit 24,25		Oct. 24	Unit 24,25		Nov. 11	Unit 24,25		Oct. 30	Unit 24,25	
Lab. Day 10	Nov. 18	D		Oct. 31	D		Nov. 18	D		Nov. 6	D	
Lab. Day 11	Nov. 25	D		Nov. 7	D		Nov. 25	D		Nov. 13	D	
Lab. Day 12	Dec. 2	Unit 28		Nov. 14	Unit 28		Dec. 2	Unit 28		Nov. 20	Unit 28	
Lab. Day 13	Dec. 9	Unit 29		Nov. 21	Unit 29		Dec. 9	Unit 29		Dec. 4	Unit 29	
Lab. Day 14	Dec. 16	Unit 30		Dec. 5	Unit 30		Dec. 16	Unit 30		Dec. 11	Unit 30	

Laboratory Topic	Project	
A	Celestial Sphere	
M	Moon	
S	Sun	SkyGazer
B	Telescopes	Units 24, 25, 26
D	Photometry	
E	Spectra	Units 28, 29,30