Astronomy PHYSICS 109 Summer 2011

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Class location: Olin 103 **Lab location:** Olin 105
Class times: MTWRF 12:15-1:30 lecture, MWF 9:00-11:00 lab
Class web: http://www.wfu.edu/~ecarlson/astro

Materials: ***The Essential Cosmic Perspective, 5th edition*** by Jeffrey Bennett *et al.*, Laptop computer, *Skyglobe* software, calculator

Description: Physics 109 is an intensive introductory course in astronomy. Topics covered will include the night sky, the solar system, stars and stellar systems, galaxies and the universe as a whole. Elementary physics and mathematics will be used to obtain both a qualitative and a quantitative understanding of astronomy.

Reading Quiz: There will be a reading quiz on the reading assignment for every class. This must be completed before 11:30 on the day of class. The reading quizzes are conducted in Sakai, as found at the website

https://sakai.wfu.edu/portal/

If you are registered for the course, you should automatically have access to this website. If you do not, contact Prof. Carlson. **You should use Firefox, not Google Chrome, when completing assignments on Sakai.**

You should regularly look at this page for upcoming assignments. Normally, I will try to have two such assignments posted at all times. Read your book, then click on the appropriate assignment. You can now look at any of the questions, one at a time, and decide which answer you want. If you decide you aren't ready to answer a question, you can go back and answer it later.

When you are ready, you can click on the answer and then hit the "Submit" button for the reading quiz. When you submit your answers, you should immediately get credit for your answers, and then be told the correct answer.

Only one attempt may be made for each quiz. The program should keep you updated on your total number right/wrong for that reading quiz. If you have problems, please contact me.

Class Participation: Attendance is required at all lectures, **including both Saturday lectures**. Unexcused absences from more than two lectures can negatively affect your grade. Note also that there is also an evening lecture on Wednesday, June 22.

Tests: There will be three in-class tests during the semester on **June 1, 10, and 20** in class. The final exam will be at **2:00 Wednesday June 29**. **None of these grades will be dropped**. Half of the questions on the final will cover the final quarter of the course; the other half will be a review of the entire course. Alternate times will normally not be allowed for the final or any other exam. Exams which are missed can only be made up if

proof is provided of illness or family or other emergency. To every test, you must bring **your student ID, #2 pencil, and a calculator**.

Cheating: Any evidence of cheating will be turned over to the honor board for consideration. The normal consequence for an honors code violation is an irreplaceable F in the course and a one semester suspension from all courses.

Labs: Labs will be held for two hours every Monday, Tuesday, Wednesday from 9:00-11:00 in **105 Olin Physical Laboratory** beginning **Wednesday, May 25**. You are expected to attend and complete all twelve of the labs. Your lowest lab grade will be dropped. **Be prepared on any given night to go outside.** You should bring to lab the following: pencil, eraser, lab description/sheets, calculator, laptop computer.

Lab manual: There is no lab manual for this course. Instead, you are expected to download all necessary labs from the web page as described below in the section "web." If you do not download it, you can purchase a copy from the TA on duty.

Absences: If you miss a lab for any reason, email or call my office number immediately (that night). If you are too sick to call, I will need to see a note from the hospital (if you're not in the hospital, you're not too sick to call). Then I will write you a note, and you will find another section that is doing the same lab. The same procedure is required for tests. You do not need a note to miss class. **The only excused reasons for absence are illness, official WFU events that require attendance, or absences approved <u>in advance</u> by Dr. Carlson.** Never ask you TA for permission to make up a missed lab; he cannot grant it.

World-Wide-Web: Lab schedules, lab descriptions, old tests, grades, and other important information for this course will be available from the Astronomy Class Home Page on the World-Wide-Web. The URL for this information is

http://www.wfu.edu/~ecarlson/astro

Grading: Your grade depends on your scores on the reading quiz, exams, final, and labs in the proportions shown below. The grading scale is shown at right. I reserve the right to adjust this scale, but usually such adjustments are small, particularly at the high end of the grading scale. **However, if you receive a final lab grade that is less than 60%, you will fail the course.** It is easy to score well above 60% provided you attend all of your lab sections and work hard on the labs.

Grading Breakdown		Grading Scale					
Exams:	3 × 15%	93%	A	80%	B-	67%	D+
Final:	30%	90%	A-	77%	C+	63%	D
Reading:	5%	87%	B+	73%	C	60%	D-
Labs:	20%	83%	B	70%	C-	<60%	F

Contacting me: Please feel free to contact me by e-mail or make an office appointment whenever you want to. I am much more approachable than you might expect, and I am happy to help you prepare for the exams, or whatever. If you have a quick question, you can try me by e-mail.

Schedule

Section 1: Naked Eye Astronomy, Basic Principles

Tue. May 24	Introduction; Scale of the Universe	Sections 1.1-1.3
Wed. May 25	Motion of the Heavens	Sections 2.1-2.4
Thu. May 26	History, Newton's Laws, orbits	Sections 3.3, 4.2-4.4
Fri May 27	Gravity, EM waves, Doppler shift	Gravity lecture, Section 5.1
Mon. May 30	Atomic spectra, Hot stuff	Section 5.2
Tue. May 31	Telescopes, Survey of Solar System	Sections 5.3, 6.1

Section 2: The Solar System

Wed. June 1	**Test 1**, Formation of the Solar System	Section 6.2-6.4
Thu. June 2	Earth	Sections 7.1, 7.5
Fri. June 3	Moon and Mercury	Section 7.2
Sat. June 4	Venus and Mars	Sections 7.4, 7.3
Mon. June 6	Jupiter and Saturn	Section 8.1
Tue. June 7	Neptune, Uranus, Moons of Jupiter	Section 8.2
Wed. June 8	More moons, rings, comets	Sections 8.3, 9.2, 9.3
Thu. June 9	Asteroids, meteorites, extrasolar planets	Sections 9.1, 9.4, 6.5

Section 3: The Life History of Stars

Fri. June 10	**Test 2**, Intro to the Sun	(none)
Mon. June 13	The Sun	Sections 10.1–10.3
Tue. June 14	Measuring stars, the H-R diagram	Sections 11.1, 11.2
Wed. June 15	Life cycle of low mass stars	Sections 12.1, 12.2
Thu. June 16	Life cycle of high mass stars	Section 12.3
Fri. June 17	Neutron stars, black holes, stellar clusters and binary star evolution	Sections 13.2, 11.3, 13.1, 13.3

Section 4: Galaxies and the Universe

Mon. June 20	**Exam 3**, Intro to our galaxy	(none)
Tue. June 21	The Milky Way, dark matter	Sections 14.1, 14.2, 14.4, 16.2
Wed. June 22	Galaxy classification, collisions	Sections 15.1, 15.3
Wed. June 22	9:00 Active galaxies, distance ladder	Sections 15.4, 15.2
Thu. June 23	Large scale structure, cosmology	Sections 16.3, 16.1, 16.4
Fri. June 24	Cosmic eschatology, the big bang	p. 492, Sections 17.1, 17.2
Sat. June 25	Inflation, multiple Universes	Sec. 17.3, Multiple Universes
Mon. June 27	Life in the Universe	Sections 18.3, 18.4

Wed. June 29 **2:00 Final Exam**