ASTRONOMY 291
Basic Astrophysics &
Planetary Astronomy
Fall Quarter 2007
Mo Tu We Th Fr 12:30pm
Evans Lab 2002

Instructor: Professor Barbara Ryden
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Office hours: Mo Fr 3:00 - 5:00 pm, or by appointment
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Textbook: Basic Astrophysics, by Barbara Ryden and Bradley Peterson. A draft of this textbook (to be published by Addison-Wesley in 2008) will be provided to you.

Web site: www.astronomy.ohio-state.edu/~ryden/ast291/
(The Web site contains the course syllabus, as well as other useful information. Bookmark it now, before you lose this piece of paper!)

Course objectives and philosophy:
This is the second course of the two-quarter introductory sequence which is intended for sophomore astronomy majors, as well as other scientifically literate undergraduates who want to learn basic astronomy from a quantitative perspective.

The specific major topics to be covered in this course are (a) the historical development of modern astronomy, (b) the fundamentals of Newtonian gravity and optics as applied to astronomy, and (c) the structure and evolution of the Solar System.

To get the most from this course, you should read the book, attend the lectures, and do the problem sets.

Problem sets:
Problem sets will be assigned on Wednesday (beginning September 26), and will be due the following Wednesday, at the beginning of class. The problem sets will be graded and will count for 25% of your course grade. In general, late work will not be accepted for credit, except with prior approval of the professor.
Review sessions:
Review sessions, run by the T.A. or the professor, will be held before each midterm and before the final exam.

Examinations:
There will be two closed-book, closed-notes midterm exams, scheduled for Friday, October 19 and Friday, November 16. Each midterm will count for 25% of your course grade. A comprehensive final exam will be given on Tuesday, December 4 at 11:30 am. The final exam will account for 25% of your course grade. For each exam, you will be permitted to bring a single sheet of notes (a standard 8 1/2 by 11 inch sheet of paper – using both sides, if you like).

Make-up Exams:
Make-up exams will be allowed only under extraordinary circumstances, such as severe illness or a death in the immediate family. If you know in advance that you are going to miss an exam (you’ll be out of town for an approved University function, for instance), please contact the professor as soon as possible to make alternate plans for taking the exam.

If you miss the final exam, you will receive a failing grade unless you contact the professor by 5 pm on Friday, December 7, and arrange to take a makeup final at the beginning of Winter Quarter. (In such a case, you would receive a grade of Incomplete until your makeup exam was graded.)

Academic Misconduct:
In the context of this course, you are permitted – and encouraged – to work with other students on the problem sets. Please note, however, that during midterm exams and the final exam (which together make up 75% of your grade), you will be on your own. Copying during exams will not be tolerated. Additional information about what constitutes academic misconduct is available at studentaffairs.osu.edu/resource_csc.asp.

Disability Services:
Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated, and should inform the professor as soon as possible of their needs.
BRIEF COURSE OUTLINE

Midterm Exam Dates: October 19, November 16
FINAL EXAM: Tuesday, December 4, 11:30 am

Week 1  (Sep 19 - Sep 21)  Chapter 1: Early Astronomy
Celestial Sphere, Coordinate Systems, Celestial Motions, Time

Week 2  (Sep 24 - Sep 28)  Chapter 2: Emergence of Modern Astronomy
Greek Astronomy, Ptolemy, Copernicus, Galileo, Kepler

Week 3  (Oct 1 - Oct 5)  Chapter 3: Orbital Mechanics
Newton’s Law of Gravity, Orbital Energetics, Virial Theorem

Week 4  (Oct 8 - Oct 12)  Chapter 4: The Earth – Moon System
Precession, Tides, Phases, Rotation of Moon, Eclipses

Atomic Structure, Emission & Absorption, Radiation Transfer, Blackbodies
Review: Thursday, October 18
EXAM: Friday, October 19

Week 6  (Oct 22 - Oct 26)  Chapter 6: Astronomical Detection of Light
Refractors & Reflectors, Instruments & Detectors, Other Wavelengths

Week 7  (Oct 29 - Nov 2)  Chapter 7: The Sun
Observable Layers, Solar Activity, Angular Momentum

Week 8  (Nov 5 - Nov 8)  Chapter 8: Overview of the Solar System
Types of Planets, Properties of Planets, Formation of Solar System

Week 9  (Nov 12 - Nov 16)  Chapter 9: Earth and Moon
Earth’s Interior & Atmosphere, Moon’s Interior, Origin of the Moon
Review: Thursday, November 15
EXAM: Friday, November 16

Week 10 (Nov 19 - Nov 21)  Chapter 10: The Planets
Terrestrial Planets, Jovian Planets, Rings

Week 11 (Nov 26 - Nov 30)  Chapter 11: Small Bodies in the Solar System,
Chapter 12: The Solar System in Perspective
Dwarf Planets, Asteroids, Comets, Small Debris

FINAL EXAM: Tuesday, December 4, 11:30 am, 2002 Evans Lab