ASTRONOMY 161
Introduction to Solar System Astronomy

Spring Quarter 2007
Mo We Fr noon – 1:18 pm
Stillman 100

Instructor:	Prof. Barbara Ryden
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Office hours:	Mo 2:30 pm – 5 pm, Tu 9 am – noon, or by appointment
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Textbook:

Universe (seventh edition), by Roger A. Freedman and William J. Kaufmann (W. H. Freeman & Co., New York, 2005)

Web site:

`www.astronomy.ohio-state.edu/~ryden/ast161.html`

(The Web site for this course contains the instructor's lecture slides, as well as links to other interesting astronomy sites on the Web. The Web site is a useful supplement to the lectures and textbook readings, but its use is not necessary to pass the course. The publisher's Web site for the textbook, www.whfreeman.com/universe7e, is also a useful source of information.)

Grading policy:

The course grade will be determined from the results of two in-class midterms (20% each), a final exam (40%), and six take-home problem sets (a total of 20%). The midterms will be on Friday, April 20 (the end of week 4) and on Friday, May 18 (the end of week 8). The final exam will be on **Wednesday, June 6, at 11:30 am**. The problem sets will be handed out on the following Fridays: April 6, April 13, April 27, May 4, May 11, and May 25. (They will also be made available in electronic format on the class website.) The problem sets will be due at class time on the Wednesday after they are handed out.

The midterms and final exam will be closed-book, closed-notes, multiple-choice tests. Each midterm will include 50 questions; the final exam will include 100 questions, and will be cumulative, covering the entire course. If you know in advance that you will miss an exam because of attendance at an official University-sponsored activity, please contact the professor before the scheduled exam date to arrange a makeup exam. If you miss a midterm due to a sudden illness or other unforeseen emergency, please contact the professor as soon as possible after the missed exam. If you miss the **final exam**, you will receive a grade of incomplete (I) for the course; it will be your responsibility to contact the professor as soon as possible to make up the final exam.

Each problem set will consist of 5 open-book, open-notes, short-answer problems. Each of the 5 problems will be graded on a 2-point scale: 2 points if it's totally correct, 1 point if it's partially correct, 0 points if it's wrong. Working in groups is permissible. All problem sets will be due on Wednesday *at class time*. Problem sets handed in to the professor's office between 1:30 pm and 5:00 pm Wednesday will suffer a deduction of 2 points (out of 10 total); problem sets handed in between 5:00 pm Wednesday and 1:30 pm Thursday will suffer a deduction of 4 points (out of 10). No problem sets will be accepted more than 24 hours after they are due.

General Education Curriculum (GEC) goals:

Astronomy 161 is a GEC Physical Science course in the Natural Science category. The goals for this course include:

• Understanding the theories and methods of modern astronomy, and their relation to other ideas in the physical sciences.

• Investigating the relation between science and technology.

• Exploring the effects of science and technology on the Earth's environment and on human society.

In Astronomy 161, the specific learning objectives to achieve these course goals are:

• To investigate the basic facts, principles, theories, and methods of modern science as practiced in astronomy. (In other words, we'll ask not only 'What do astronomers know?' but also 'How do they know it?')

• To learn important events in the history of astronomy (particularly the development of our understanding of the nature of the Solar System and the discovery of the physical laws that govern its motions).

• To explain the role of modern technology in the investigation of the Solar System (where "modern technology" embraces everything from Galileo's telescope to cutting-edge spacecraft).

• To consider human impacts on planet Earth (including, for instance, global warming and the thinning of the ozone layer).

Classroom etiquette:

For 78 minutes every Monday, Wednesday, and Friday, we form our own little commonwealth in Stillman 100. To avoid civil war, a few basic rules of etiquette are required.

• Please silence your cellphone. (This is particularly important during exams!)

• Please do not use a wireless laptop or other networked device during class. (Exceptions will be made for assistive technologies for the hearing or vision impaired.)

• Please do not start packing up until class is completely over. (The rustling of papers and shifting of backpacks during the last minute of lecture is very distracting.)

• Please do not engage in conversation – even if you think you are whispering inconspicuously. (In Stillman 100, the curved walls reflect and focus the sound.)

Students with disabilities:

Any students who feel they may need an accommodation based on the impact of a disability should contact the professor privately to discuss their specific needs. The professor will work with the Office of Disability Studies to develop appropriate accommodations for students with documented disabilities.

COURSE SCHEDULE

Midterm Dates: Friday, April 20 & Friday, May 18
FINAL EXAM: Wednesday, June 6, 11:30 am

Mon, March 26: Introduction to Astronomy
Text: Chapter 1

Wed, March 28: The Celestial Sphere
Text: Sections 2-1 through 2-4

Fri, March 30: Seasons and Calendars
Text: Sections 2-5 through 2-8

Mon, April 2: Moon Phases and Eclipses
Text: Chapter 3

Wed, April 4: The Copernican Revolution
Text: Sections 4-1 and 4-2

Fri, April 6: Kepler and Galileo [**Problem Set 1 assigned**]
Text: Sections 4-3 through 4-5

Mon, April 9: Newton's Laws
Text: Sections 4-6 and 4-7

Wed, April 11: Applying Newton's Laws [**Problem Set 1 due**]
Text: Section 4-8

Fri, April 13: Light [**Problem Set 2 assigned**]
Text: Sections 5-1 through 5-4

Mon, April 16: Spectra
Text: Sections 5-5 through 5-9

Wed, April 18: Telescopes [**Problem Set 2 due**]
Text: Chapter 6

Fri, April 20: **FIRST MIDTERM EXAM**

Mon, April 23: Solar System Overview
Text: Chapter 7

Wed, April 25: Origin of the Solar System
Text: Sections 8-1 through 8-5

Fri, April 27: Planets Around Other Stars [**Problem Set 3 assigned**]
Text: Section 8-6

Mon, April 30: The Earth
Text: Sections 9-1 through 9-4

Wed, May 2: Earth's Atmosphere [**Problem Set 3 due**]
Text: Sections 9-5 through 9-7

Fri, May 4: The Moon [**Problem Set 4 assigned**]
Text: Chapter 10

Mon, May 7: Mercury
Text: Chapter 11

Wed, May 9: Venus [**Problem Set 4 due**]
Text: Chapter 12

Fri, May 11: Mars [**Problem Set 5 assigned**]
Text: Chapter 13

Mon, May 14: Jupiter and Saturn
Text: Sections 14-1 through 14-8

Wed, May 16: Rings [**Problem Set 5 due**]
Text: Sections 14-9 through 14-12

Fri, May 18: **SECOND MIDTERM EXAM**

Mon, May 21: Moons of Jupiter and Saturn
Text: Chapter 15

Wed, May 23: Uranus and Neptune
Text: Sections 16-1 through 16-8

Fri, May 25: Beyond Neptune [**Problem Set 6 assigned**]
Text: Section 16-9

Mon, May 28: Memorial Day, no class meeting

Wed, May 30: Asteroids [**Problem Set 6 due**]
Text: Sections 17-1 through 17-6

Fri, June 1: Comets
Text: Sections 17-7 through 17-9

FINAL EXAM: Wednesday, June 6, 11:30 am, Stillman 100