

Astronomy 103 Summer 2014: Introduction to Astronomy and The Solar System

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Class: Hume Room 107 M-Th 1:00 pm to 2:50 pm

Lab: Two evenings/week day M-W or T-Th, Discussion 8:00-8:30, Lab: 8:30-10:30 pm

Office Hours: M-Th 3:00-5:00pm Lewis Hall #122 (other times by appointment)

Text: Cosmic Perspective, Bennett et al., 7th Edition, 2013

Learning Objectives:

1. To learn the physics background and history of astronomy,
2. to learn the characteristics and science of the solar system, and
3. to participate in observing and astronomical experiments

Read the assigned chapter **before** class. The schedule below is subject to adjustment.

Date	Subject	Chapter
27 May	Introduction, scale and history of the universe, spaceship Earth	1
27 May	Patterns in the sky: Constellations , Seasons	2
28 May	Patterns in the sky: Lunar phases, eclipses, retrograde motion, parallax	2
28 May	History of astronomy, Copernicus, Kepler, Galileo,	3
1 June	Astronomical time: sidereal, solar, synodic, RA-Dec, Long, Lat.	S1
1 June	Physics: Energy, Temperature, Matter, Phases, atoms, spectroscopy	4
2 June	Physics: Newton's Laws, Gravity, Escape Velocity, Mass, Tides	4
2 June	Physics: Light, spectra, thermal radiation, Doppler shift	5
3 June	First hour test	1-5
3 June	Telescopes: types and characteristics	6
4 June	Our Solar System: Tour and Patterns	7
4 June	Our Solar System: Formation and Age	8
8 June	Terrestrial Planets: planet shaping processes, Moon & Mercury	9
8 June	Terrestrial Planets: Earth and Venus	9
9 June	Terrestrial planets: Mars	9
9 June	Terrestrial planet atmospheres:	10
10 Jun	Terrestrial planet atmospheres: Greenhouse effect, Ozone,	10
10 Jun	Second hour test	6-10
11 Jun	Introduction to the Outer Solar System	11
11 Jun	Giant Planets: Jupiter's mysteries	11
15 Jun	Giant planets: Planetary Interiors/Atmospheres: Jupiter, Saturn	11
15 Jun	Giant planets: Planetary Interiors/Atmospheres: Uranus, Neptune	11
16 Jun	Giant planets: Rings & Moons: Jupiter, Saturn, Uranus, and Neptune	11
16 Jun	Small solar system bodies: Asteroids and Comets	12
17 Jun	Small solar system bodies: Pluto, Kuiper Belt, Meteors	12
17 Jun	Small solar system bodies: small bodies tell big tales, the Nice model	12
18 Jun	Extrasolar Planets: worlds around stars beyond the sun	13
18 Jun	Third Hour Test	11-13
22 Jun	Our star: Sunspots, Solar Magnetism, Flares, Energy Transport	14
22 Jun	Our star: Why does the sun shine? Nuclear fusion, neutrinos	14
24 Jun	COMPREHENSIVE FINAL EXAM chapters 1-14 8:00 am	1-14

Semester Grade Algorithm:

25% Labs: You must do at least 75% of the labs to pass.

19% Daily Quizzes/Homework and Discussion: expect short in class quizzes too.

12% 1st Test

12% 2nd Test

12% 3rd Test

20% FINAL EXAM: Plan for the final exam on correct date.

Mid-term grade if needed will be 1/3 labs, 1/3 quizzes, 1/3 test 1

Attendance at all classes is expected. The Automated Attendance System using your Ole Miss ID card may be used. Always have your ID with you.

Hard copies of chapter outlines and homework/quizzes will be handed out at the end of classes. There may also be short in-class quizzes. Scantron answer sheets to homework/quiz answers will be due the next class day. You may only turn in your own work - not that of others.

Answers to HW/quizzes and tests will be posted on "Blackboard". Keep back quizzes and tests to correct and use as study guides for the final exam. Quizzes and tests will be mainly based on the text though other topics will be covered during the lectures.

Chapter outlines for each chapter will be posted on Blackboard. These can be printed out and used for study guides.

Missed tests or in class homework/quizzes must be made up during my office hours within 2 class days of being given unless special permission is granted.

Lab Sections: for questions contact the lab TA. Missing more than 25% of labs will cause failure for the course.

Come at the correct time for labs! Monday & Wednesday or Tuesday & Thursday at Lewis 1 or Kennon Observatory. Some afternoon lab activities during class hours may be held and probably an off campus observing session at the dark sky site.

For information: <http://www.phy.olemiss.edu/~ttorma/Astro/Lab/Lab.html>

ASTRO 103 Lab Manual is **required**. Available at the Printing Office across from the Police Station. You will also need a scientific pocket calculator. The Texas Instruments TI-30Xa is a good choice. Bring the calculator to labs.

Reasonable accommodations for absences and for students with disabilities can be provided with advance notice.

Recommended web sites: (I'm always looking for other good sites to check out)
APOD (Astronomy Picture of the Day) at apod.nasa.gov daily images and information
Another interesting site to subscribe to is universetoday.com for space news.
Get monthly sky maps and info at skymaps.com

Recommended supplementary books (for lifelong learning) – Some of my favorites. If you find another great one, please let me know)

First Light: The Search for the Edge of the Universe, Richard Preston, Random house, 1996
Fly-on the wall description of Palomar astronomer's search for quasars & asteroids.
Rare Earth: Why Complex Life is Uncommon in the Universe, Peter Ward & Don Brownlee, Copernicus Books, 2000. The subtitle says it all. Fascinating read.
The Life and Death of Planet Earth, Peter Ward & Don Brownlee, Times Books, 2002
Find a Falling Star, Harvey Nininger, Erikson, 1972, hard to find, but if you don't want to go look for meteorites after reading this, don't blame me.
The Discovery of Neptune, Morton Grosser, Harvard Press, 1962, Absorbing history.
Out of the Darkness: The Planet Pluto, Clyde Tombaugh, Stackpole Books, 1980, the discovery of Pluto told by its discoverer.
How I Killed Pluto & Why It Had it Coming, Mike Brown, Spiegel-Grau, 2012, Mike Brown, how Pluto got "demoted" told by the person who caused it. Great read.
Cosmos: A Personal Odyssey Carl Sagan, Random House, 1980
Dated, but still a fascinating read. (also on DVD as is the reissued one from 2014)
Roving Mars: Spirit, Opportunity, and the Exploration of the Red Planet, Steve Squyres, Hyperion books, 2005, The principle scientist of the rover missions tells the story.

Supplementary DVDs, can be ordered from Amazon

Wonders of the Solar System, Brian Cox, modern discoveries in a "gee whiz" format.
Cosmos, Carl Sagan, the original from 1980 is better than the new one.

DVD courses from "The Teaching Company". www.thegreatcourses.com.

Expensive, but great references. Other classes in their catalog on many subjects
Understanding the Universe 2nd ed, Alex Fillipenko, master teacher and cosmologist covers all of astronomy.
New Frontiers: Modern Perspectives on Our Solar System, Frank Summers, Space Telescope astronomer reveals new data.
The Origin & Evolution of Earth: From the Big Bang to the Future of Human Existence, Robert Hazen, Hard to stop watching this comprehensive and slightly biased description.