

Astronomy 101 Laboratory

Fall 2008 - Schedule

(including pre-lab reading assignments)

Aug 27	Lab 01	Constellations and Observatory Tour (Telescopic Observing Lab (13) assigned) To teach students about constellations and sky motions (using the Planetarium) and to familiarize students with the Observatory. (Astro 101 Textbook 2.1, A-34)
Sep 03	Lab 02	Early Astronomical Measurements (Moon Observing Lab (12) assigned) Students need to learn how early astronomers made measurements. Important aspects of making scientific measurements are covered. Contains information vital to understanding Kepler's laws. Ideas about parallax are included. (Astro 101 Textbook, pp 29-31, 48-49)
Sep 10	Lab 03	Kepler's Laws and the Orbits of Planets With a basic background in measurement, students are ready to explore an empirical model of planetary orbits. Computer simulations allow the physical model of gravity and Kepler's empirical model to be used together. (Astro 101 Textbook, pp 65-67)
Sep 17		-- No lab -- REMEMBER TO WORK ON THE TAKE-HOME LABS!
Sep 24	Lab 04	Building an Astronomical Telescope Building a telescope shows how lenses are used to construct a telescope, and investigates the properties of the images formed. (Astro 101 Textbook, pp 121-124)
Sep 24	Lab 01	Constellation Observing Lab (Lab 01) – bonus date
Oct 01	Lab 05	Mapping Planetary Surfaces. In this activity we use modern spacecraft-based images of planetary surfaces to learn how planetary scientists study the history of a planet's surface. (Astro 101 Textbook, Chapter 7)
Oct 08	Lab 06	Measuring the Mass of Jupiter Here we have the opportunity to review all of the previous topics by combining them into a single activity. Using a computer simulation, we observe Jupiter through a telescope. We measure the angular separation of Jupiter's moons from Jupiter at various times and use this information to measure the period and size of the various orbits. We then use Newton's version of Kepler's third law to find the mass of Jupiter. (Astro 101 Textbook, pp 95-96, 8.2)
Oct 15	Lab 01	Constellation Observing Lab (Lab 01) to be completed
Oct 15		-- No lab -- REMEMBER TO WORK ON THE TAKE-HOME LABS!

Oct 22	Lab 07	<p>Classification of Stellar Spectra and the Sizes of Stars Students learn to classify stellar spectra. Stellar spectra, photometry, distance determination, and a simple stellar model are combined to figure out the sizes of a few stars. (Astro 101 Textbook, 11.1)</p>
Oct 29	Lab 08A	<p>Astronomical Observing with the SARA Telescope Students will learn how basic astronomical images are handled and will also prepare an observing plan for remote use of the SARA Telescope in Arizona.</p>
Oct 29/30	Lab 08B	<p>Astronomical Observing with the SARA Telescope (To be scheduled)</p>
Nov 05/06	Lab 08B	<p>Astronomical Observing with the SARA Telescope (Back-up dates -- To be scheduled if needed)</p>
Nov 05	Lab 09	<p>Photometry of the Pleiades. Students use a computer simulation to observe the visual magnitude and color of stars in the Pleiades. These are used to construct a Hertzsprung-Russell diagram and find the distance to the cluster. The age of the cluster can also be determined. (Astro 101 Textbook, 11.2 – 11.3)</p>
Nov 12	Lab 10	<p>Astronomical Data Reduction and Analysis Students will “reduce” and analyze their images obtained in previous weeks with the SARA telescope. This lab demonstrates how astronomers use images to obtain information about astronomical objects.</p>
Nov 19		<p>-- No lab -- REMEMBER TO WORK ON THE TAKE-HOME LABS!</p>
Nov 26		<p>-- Thanksgiving Recess --</p>
Dec 03	Lab 11	<p>Hubble’s Law and the Expansion of the Universe Students’ use a computer simulation to measure the cosmological redshift in several clusters of galaxies. These are used to find the Hubble constant and examine the expansion of the universe. (Astro 101 Textbook pp 414-420)</p>
Dec 10	Lab 12	<p>Moon Observing Lab (Lab 12) due in ASTR 101 lecture</p>
Dec 10	Lab 13	<p>Telescopic Observing Lab (Lab 13) due in ASTR 101 lecture</p>
Dec 10	MU Lab (6:30-9:00pm)	<p>Cepheid Variable Stars and Distance Measurements Students examine a period-luminosity relationship for Cepheid variables and find the distance to the Small Magellanic Cloud. This lab is shows how to measure distance using an object of known brightness. (Astro 101 Textbook, pp 411-414)</p>