

Astronomy 104 Spring 2021 Instructor: Dr. Don Summers 915-7032 summers@phy.olemiss.edu
 Tue 1:00 <https://zoom.us/j/91618512774> Password:astro104 Office Hrs: Lewis 221 TThF 2-3
 50 min. Labs Start Text: Cosmic Perspective, Bennett et al., 9th Ed.
 1:Jan 27, Wed 7-7:50 or 8- 8:50 Kennon Obs TA: Nauman Ibrahim, sibrahim@go.olemiss.edu
 2:Jan 27, Wed 9-9:50 or 10-10:50 Kennon Obs TA: Stephen Steenwyk, sssteenw@go.olemiss.edu
 3:Jan 28, Thu 7-7:50 or 8- 8:50 Kennon Obs TA: Shaheed Nazrul, mnazrul@go.olemiss.edu
 4:Jan 28, Thu 9-9:50 or 10-10:50 Kennon Obs TA: Shaheed Nazrul, mnazrul@go.olemiss.edu
<http://www.phy.olemiss.edu/Astro/Lab/Lab.html>
 104 Lab Manual: Buy at Rebel Graphics, Sam-Gerard Hall

Date	Subject	Chapters to read before T or Th
19 Jan	Introduction	
21 Jan	Distances, light years, stars, constellations, galaxies	Chap 1 & 2
26 Jan	Star motion:daily/yearly Transits Angles Sidereal Time	Chap 2
28 Jan	Longitude/Latitude, Right Ascension/Declination, RA/Dec	Chap S1
2 Feb	Kepler's 3 laws, Newton's Laws, Gravity, orbits	Chap 3 & 4
4 Feb	Matter, Energy, Temperature, Atomic energy levels	Chap 5
9 Feb	Light, Wavelengths, Spectral Lines, Doppler Shift	Chap 5
11 Feb	Spectroscopes, Wien's Law, Black Body Radiation	Chap 5
16 Feb	Telescopes: Optical, Radio, X-ray, Gravity Wave...	Chap 6
18 Feb	FIRST HOUR EXAM on Blackboard Thursday 1:00	
23 Feb	Why does the sun shine?, Sunspots, Neutrinos	Chap 14
25 Feb	Stars: Distances Luminosity Magnitudes Temperature Size	Chap 15
2 Mar	HR Diagram. Stellar Masses and Binary Stars.	Chap 15
4 Mar	Gas --> New Stars, Old stars Move off the Main Sequence	Chap 16
9 Mar	Variable Stars, Red Giant and White Dwarf Stars	Chap 17
11 Mar	Supernovae, Neutron Stars, Gravity Waves, and Black Holes	Chap 18
16 Mar	Our Milky Way Galaxy, Globular Star Clusters	Chap 19
18 Mar	SECOND HOUR EXAM on Blackboard Thursday 1:00	
23 Mar	Finding Distances with Cepheid Variables, Galaxies	Chap 20
25 Mar	Hubble's Law, Redshifts, and Distances	Chap 20
30 Mar	Quasars and Active Galaxies	Chap 21
1 Apr	Mapping the Black Hole in the M87 Galaxy	Chap 21
6 Apr	Cosmology, Expanding Universe, Big Bang, 3K Radiation	Chap 22
8 Apr	Early Universe, Inflation, Big Bang, Sub-Atomic Particles	Chap 22
13 Apr	Dark Matter in Galaxies and Galaxy Clusters	Chap 23
15 Apr	Fritz Zwicky and the Discovery of Dark Matter	Chap 23
20 Apr	Life in the Universe	Chap 24
22 Apr	Conditions for Life in the Universe	Chap 24
29 Apr	COMPREHENSIVE FINAL EXAM, 12:00 noon, Thurs, not earlier!	

Grading	1st and 2nd Exams	15%	Save exams to study for the final.
Scheme	FINAL EXAM	30%	
	Lab	40%	

Class will meet on Tues. at 1:00 via <https://zoom.us/j/91618512774> Password:astro104
 Follow Blackboard for summary slides, review questions, and tests in pdf format
 Tests and movies on Thursdays at 1:00. Watch these movies
<https://www.youtube.com/watch?v=OfKBhvDjuy0> 21 Jan (Powers of Ten)
<https://www.youtube.com/watch?v=PSGg83GDcyI> 28 Jan (Voyager 2 Spacecraft)

Bring a scientific calculator (e.g. Texas Instruments TI-30Xa) to labs/tests.
 Labs will be split in two for social distancing and will last 50 minutes.
 Please come to the lab night and time you have signed up for. Labs are a
 required part of the course. You must do at least 70% of the labs to pass.
 Please wear a mask in lab and sit 6 feet apart. Grading is +/-.

$$10^{11} \times 10^{11} = 10^{22} \quad \text{stars/galaxy} \times \text{galaxies} = \text{stars in the universe}$$

Reasonable accommodations for students with disabilities will be provided.
 Learning Objectives: To learn how stars, galaxies, and other wonders
 of the Universe work and to find out how astronomers made these
 discoveries and to do some of the actual experiments.