

Instructor: Brian Harker

Office: SER 309 (797-2937)

Email Address: brian.harker@gmail.com

Class Hours: MTWRF, 12:10pm – 1:10pm in ESLC 007

Office Hours: After class or by appointment

Textbook: *Explorations: An Introduction to Astronomy*, 4th or 5th Edition
by: Thomas T. Arny

Goals: This is a fun class that will introduce you to many aspects of astronomy. I expect that, by the time we are done, you will walk away with a deeper understanding of the laws of nature that silently rule us all, and a greater respect for the sky (and it's contents) above our heads. During this course, we will learn about some of astronomy's history, our own home planet, the solar system, the sun and stars, galaxies, black holes, and beyond! This is an introductory course, but there is a whole universe of things to learn and discover (pun definitely intended). There are no prerequisites for this course, but some familiarity with simple algebra and trigonometry may be useful at times.

Assignments:

Reading: The sections outlined in the course calendar should be read before class. You will get so much more out of this class if you come prepared with any questions you might have about the relevant subject matter, and are able and ready to participate in class discussions.

Homework: Selected “Questions for Review” and “Thought Questions” will be assigned from each chapter. These homework assignments are will be due at times to be specified in class. 10% will be deducted from each

homework assignment for each class period that a homework assignment is turned in late.

Projects: Each student is required to complete one (1) Observatory Lab Report. The detailed requirements of this Report will be outlined early in the semester. In addition, each student will choose and complete two (2) “Projects” (more on this in the second week of class)

Tests:

Exams: There will be two (2) exams (1 midterms + 1 final exam) consisting of multiple-choice, true/false, and/or matching questions, given during class time.

Final Exam: The final exam will cover the last section of material, but will include an optional section (for extra credit) that spans the material covered since the beginning of the course.

Grading:

Two (2) exams at 100 points each =	200 points
Three (3) projects at 100 points each =	300 points
Homework assignments =	200 points
TOTAL =	700 points

Letter Grades:

A	700 – 610
B	609 – 520
C	519 – 430
D	429 – 340
F	< 339

Misc.:

Lab Fee:

A \$10.00 lab fee has been assessed for this course to pay for materials. It should have been paid upon registration.

DRC:

Any student who requires some accommodation (e.g. interpreter, transcriber) by the instructor should contact the DRC (Disability Resource Center, 797-2444) as soon as possible. Persons with disabilities that may prevent them from observing through a telescope should contact the instructor ASAP to make alternate arrangements.

LECTURE SCHEDULE

<u>DATE</u>	<u>CH.</u>	<u>TOPIC</u>
June 9	-	Course Introduction
10	1	Historical background
11		Early Astronomy
12	2	Mass, Inertia & Gravity
13		
16	3	Light & EM spectrum
17		
18		Atomic spectra
19	4	Telescopes
20	5	Earth: background
23		Earth: atmosphere & magnetic field
24	6	The Moon
25		
26	7	The Solar System: background
27		
30	8	The Inner Planets: Mercury, Venus,

Earth & Mars

July 1			
2	9		The Outer Planets: Jupiter, Saturn, Uranus, Neptune, Pluto (?)
3			<u>MIDTERM EXAM</u>
4			<u>NO CLASS (HOLIDAY)</u>
7	10		Meteors, Meteorites, Asteroids, Comets & Giant Impacts
8	11		The Sun: background
9			The Sun: magnetic fields
	10	12	Astronomical Measurement
11			Binary Stars, H-R diagram
14	13		Stellar Evolution: star formation & old stars
15			
16	14		White Dwarfs & Neutron Stars
17			Black Holes
18	15		The Milky Way Galaxy
21			
22	16		Galaxies
23			
24			<u>NO CLASS (HOLIDAY)</u>
25	17		Cosmology: observations of the universe
28			
29			Cosmology: origin and fate of the universe
Aug 1			<u>FINAL EXAM, 12:10pm – 1:10pm in ESLC 007</u>

OBSERVATIONS

Each student is required to perform at least one (1) observation at the Physics Department Observatory. You must take notes during the observation using the form available at the observatory or printable from the class website. You should include ALL OF THE FOLLOWING: time and date, names and classification (i.e. star, planet, moon, etc.) of the observed objects, angular positions in the sky (how many degrees above what horizon?), a description of what the object looked like with the naked eye and what it looked like through the telescope or binoculars. Any drawings/sketches must be your own (no downloaded images, photocopies).

The observatory is open ***Monday thru Thursday*** at the times announced in class (weather permitting). Please call the observatory (797-2942) prior to attending to make sure it will be open that night.

The Observatory leader for this class is:

Julia Wickstrom

juliagw@cc.usu.edu

She will supervise and guide you through the operation of the Physics Department Observatory.

More details about the observatory will be forthcoming...

PROJECTS

Every student will carry out two (2) “Project” assignments of his/her choosing from the list below. These assignments are meant to demonstrate the low-tech observational side of astronomy, and are used here to supplement your understanding from the reading and lectures. Often, a physical demonstration of a particular piece of subject matter will help to solidify your understanding of the material presented in this course.

Ch. 4 – Homemade Spectroscope

- build a low-tech piece of important astronomical equipment

Ch. 6 – Moon Observation

- naked eye and telescopic views of the moon with feature identification

Ch. 11 – Solar Observation

- calculate the size of the sun and track any visible sunspots

Each project requires a write-up of methods and results, as well as an analysis of how well your results matched up with your expectations. The write-ups will be turned in, along with any other relevant materials and/or information, at periodic times throughout the semester. Specific due dates will be announced in class.