NSCI 111-L Intro to Astronomy LAB

Dr. Johnny B. Holmes Spring 2020

CATALOG DESCRIPTION: NSCI 111-L INTRODUCTION TO ASTRONOMY LAB
Laboratory to accompany NSCI 111. Corequisite: enrollment in NSCI 111.

TEXT: Lab experiment instructions are available in pdf form (for free) with links in the schedule part of this document below.

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PREREQUISITES BY TOPIC: Basic algebra.

GOALS:
1. To provide a hands-on experience with some of the properties of motion and light used in astronomy.
2. To acquaint the student with lab techniques.
3. To show the limitations of experimental verification of scientific theories.

EXPERIMENTS:
1. Using Your Star Chart
2. Retrograde Motion and Planetary Orbits - computer simulations
3. * Circular Motion and Planetary Orbits - a laboratory analogy
4. Reflection and Refraction of Light
5. The Telescope
6. * The Spectrograph: Colors of Light and Emission of Light by Atoms
7. Polarization of Light
8. Basic Electricity
9. Basic Electromagnetism
10. Parallax and Distance Measurement
11. * Determining Distance from Light Measurements
12. Investigating Radioactivity

Opportunities for night viewing sessions with an eight inch telescope will be available. These will be scheduled as interest and weather permit.

GRADING: Each of the 12 lab sessions will be worth up to 20 points based on your participation and an oral report at the end of the session (240 points). Normal participation in a lab will be worth 18 points – it will take something extra to earn one or two more points. Being late to lab will result in a point being taken off for each 5 minutes late. Each of the three experiments marked with an * requires a written report worth up to 100 points (300 points). This makes for a total of 540 points.

A: Be present for all 12 lab sessions and accumulate at least 495 points.
(this is 12*18 normal participation points + 3*93 lab report points)

B: Be present for all 12 lab sessions and accumulate at least 471 points.
(this is 12*18 normal participation points + 3*85 lab report points)

C: Be present for at least 11 lab sessions and accumulate at least 423 points.
(this is 11*18 normal participation points + 3*75 lab report points)

D: Be present for at least 10 lab sessions and accumulate at least 390 points.
(this is 10*18 normal participation points + 3*70 lab report points)

F: Anything less than the minimum requirements for a D.

Written reports are due two weeks after the lab is completed. There will be a penalty of 5 points per lab class day a written report is late. Any late reports will not be accepted after the last scheduled lab. If a low grade is obtained on a lab report, the first lab report may be redone for up to 95 points, and the 2nd and 3rd lab reports may be redone for up to 90 points each – as long as the reports are turned in by the last scheduled lab. Lab reports may be redone as often as you have time for as long as they are turned in before the last scheduled lab. For more information on the written reports see the guide at the bottom of the page.

ABSENCES:
If you know you will miss a lab, you may make arrangements with the instructor before the lab to make the lab up at a later time. If you miss a lab without notice and wish to make up the lab, you may do so by the last scheduled lab date, but there will be a 10 point penalty. The last scheduled lab date is available for make-up labs.

DISABILITY SERVICES: If you have a disability that affects your ability to perform in class or lab, please see the CBU Student Disabilities Services web page .

WRITTEN LAB REPORT GUIDE:
1. Each lab report should be typed (computer assisted print is fine). Points will be subtracted for neatness if the report is hard to read or hard to follow.

2. Each written lab report should have the following:

a. Title of experiment, student name, partner name, date of experiment
b. Object of the experiment (one or two sentences)
c. A short description of what you did in the experiment.
d. Data (what you actually measured before calculations are performed; be sure to include units; tables are a good way of presenting data)
e. Graphs where appropriate (with labels and slope calculations if appropriate)
f. Calculations (including a statement of the equation and a sample calculation that includes units with all numbers)

g. Statement of results with appropriate comparisons (be sure to clearly mark this; include a discussion of the meaning of each graph)
h. Discussion of errors and uncertainties and accuracy of results

3. Use correct English grammar and spelling.

SCHEDULE FOR LABS (Monday)**:**

1	**AH 003**	**Jan. 6**		**Using Your Star Chart**
2	**AH 003**	**Jan. 13**		**Retrograde Motion and Planetary Orbits** **& Shadows** (last page) **Windows program Orbits**
	AH 013	**Jan. 20**		***MLK Day***
3	**AH 013**	**Jan. 27**	*	**Circular Motion and Planetary Orbits**
4	**AH 013**	**Feb. 3**		**Reflection and Refraction**
5	**AH 003**	**Feb. 10**		**The Telescope**
6	**AH 003**	**Feb. 17**	*	**The Spectrograph: Colors of Light** **images of He & Hg spectra H & Hg spectra**
7		**Feb. 24**		**Polarization of Light**
		Mar. 2		***Spring break***
		Mar. 9		***make up day***
8	**AH 013**	**Mar. 16**		**Basic Electricity**
9	**AH 013**	**Mar. 23**		**Electromagnetism**
10	**AH 013**	**Mar. 30**		**Parallax and Distance Measurement**
11	**AH 013**	**Apr. 6**	*	**Determining Distance from Light Measurements**
		Apr. 13		***Easter Monday***
12	**AH 003**	**Apr. 20**		**Investigating Radioactivity**
		Apr. 27		***make up day***