

NSCI 111-L Intro to Astronomy LAB

Dr. Johnny B. Holmes Summer Session I (June) 2019

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 word document form for download at the end of this document.

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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. Reflection and Refraction of Light
3. The Telescope
4. * The Spectrograph: Colors of Light and Emission of Light by Atoms
5. Circular Motion and Planetary Orbits - a laboratory analogy
6. Retrograde Motion and Planetary Orbits - computer simulations
7. Parallax and Distance Measurement
8. * Determining Distance from Light Measurements
9. Basic Electricity
10. Electromagnetism
11. 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 9 lab sessions will be worth up to 20 points based on your participation and an oral report at the end of the session (180 points max). [Normal oral reports are usually worth 18 points.] Each of the three experiments marked with an * requires a written report worth up to 100 points (300 points max). This makes for a total of 480 points max. Attendance at night viewing sessions is optional and up to 10 bonus points will be awarded for the first one attended. (No points will be awarded for any subsequent session attended.)

- A: Be present for all 9 lab sessions and accumulate at least 441 points.
- B: Be present for at least 9 lab sessions and accumulate at least 417 points.
- C: Be present for at least 8 lab sessions and accumulate at least 387 points.
- D: Be present for at least 7 lab sessions and accumulate at least 360 points.
- F: Anything less than the minimum requirements for a D.

Written reports are due one week after the lab is completed. (This gives you one week-end to write the report). There will be a penalty of 5 points per lecture class day for each day a written report is late. Any late reports will not be accepted after Thursday, June 27. 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 Thursday, June 27, but there will be a 10 point penalty.

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 at: <https://www.cbu.edu/disability-services> .

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:

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|---|---|---------|---|---|
| 1 | W | May 29 | * | <u>Using Your Star Chart</u> |
| 2 | M | June 3 | | <u>Reflection and Refraction</u> |
| 3 | W | June 5 | | <u>The Telescope</u> |
| 4 | M | June 10 | * | <u>The Spectrograph: Colors of Light</u>
with images: <u>HeHg</u> and <u>HHg</u> |
| 5 | W | June 12 | | <u>Circular Motion and Planetary Orbits & Retrograde Motion and Planetary Orbits</u> |
| 6 | M | June 17 | | <u>Parallax and Distance Measurement</u> |
| 7 | W | June 19 | * | <u>Determining Distance from Light Measurements</u> |
| 8 | M | June 24 | | <u>Basic Electricity & Electromagnetism</u> |
| 9 | W | June 26 | | <u>Investigating Radioactivity</u> |