

## **PHY293 Exploring Astronomy Lab – Spring 2010**

Tuesday 7:00 pm – 9:15 pm, WSB 107

### **Professor**

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### **Office hours:**

Monday 4:00-5:00  
Tuesday 2:00-3:30  
Wednesday 2:00-3:30  
and by appointment

### **Course Objectives and Description**

This course is designed to provide you with hands-on experience in the techniques of basic astronomical observations. Along the way you will become familiar with the scientific methodologies and analytical skills necessary to interpret data and make your own discoveries. I hope to convey to you some of the excitement and satisfaction that scientists derive from investigating and understanding the physical world around us, while simultaneously inspiring and motivating you to do the same.

We will observe the night sky using the naked eye, binoculars, and small telescopes, as well as undertake indoor laboratory and computer activities. In a typical semester there is more cloudy weather than good weather, so we will generally spend a good portion of the class doing indoor activities.

The class is usually made up of students with diverse science backgrounds but is generally oriented to non-science majors.

### **Prerequisites and Corequisites**

There are no prerequisites or corequisites for this course. However, if you are interested in learning the concepts of this course in more detail, I suggest you take either of the two astronomy general education courses, PHY 205 Exploring the Solar System and PHY206 Exploring the Universe.

### **Required Materials**

- Planisphere (also called a starwheel; I recommend the 10" Miller Planisphere, 40°N Latitude)
- Flashlight with red filter
- Calculator with basic scientific functions
- Print-outs of each week's lab activity

### **Course Format**

Each week you will do a laboratory activity that will be graded based on your performance, the quality of your work, and your demonstrated understanding of the concepts involved. Each activity will be graded as "Pass" or "No Pass." If you do not pass an activity, you may rework any parts of it you had problems with and have it graded again. Each lab can be graded a maximum of two times: the first try plus one possible rework. The number of labs you successfully complete determines your grade. The total number of labs possible minus two results in an A, total minus three is a B, and so on. In a typical semester there are 13 labs. There are no tests or quizzes; there is no final exam.

## Required Exercises

There are two particular exercises that emphasize the most basic and fundamental principles of observational astronomy. "Astronomical Motions I: Motions of the Night Sky" requires you to observe the night sky on your own at home over the course of one evening. "Astronomical Motions II: Celestial Motions" is a long-term observing exercise that requires you to make multiple observations of the sunset and moon over six weeks. These labs require more work than the other labs and can be thought of as a midterm and final. Both of the required labs are worth twice as much as a regular lab. Therefore, although there are typically 13 lab activities in the class, the grading scale below has a total of 15 lab passes possible. Additionally, *no student may earn an A in the course without passing both of the required labs*. In other words, if you pass every single lab except a required lab you will have 13 passes but you will receive a B in the course.

## Grading Scale

Typical grading scale with a total of 15 passes possible:

*The grading scale may be adjusted if unforeseen circumstances cause there to be fewer or more labs in the semester.*

Grade	Number Passed
A	13
B	12
C	11
D	10
F	≤9

## Late Work

Typically, exercises are conducted in class and the lab is due the following week in class. In addition, any rework attempts are also due after one week. Labs that are not turned in on time will automatically receive a grade of "No Pass" which counts as one of the two attempts at that exercise. As a result, the absolute last day to turn in a lab for the first time is two weeks after the lab activity.

## Attendance

Attendance is mandatory. As a laboratory course there are interactions that cannot be reproduced on your own. The grading format allows you to miss two classes because unavoidable situations sometimes arise which may cause you to miss class. Use these missed labs wisely. I will do my best to help you make up a lab that you must miss for an excused reason, but because our activities are affected by weather and sometimes particular equipment is needed, I cannot guarantee you will be able to make up any specific lab.

## Blackboard

I will use the Blackboard course management software as part of this class. The Blackboard system is located at <https://blackboard.newpaltz.edu/> or via a link on the main New Paltz website. I will use Blackboard to post your grades, provide course materials, and email you. Typically I will either tell you in class or via email the two lab activities we may do each week (one indoor, one outdoor). You are responsible for bringing print-outs of each week's possible lab activities to class. I encourage you to familiarize yourself with the lab activity before you arrive in class; the more prepared you are, the more quickly and efficiently you will be able to complete the assignment.

## Academic Honesty

Students are expected to maintain the highest standards of honesty in their academic work.

Cheating, forgery, and plagiarism are serious offenses, and students found guilty of any form of academic dishonesty are subject to disciplinary action. You may work with others only under the conditions described in the section "Collaboration".

### **Collaboration**

Science is a collaborative effort. Therefore, you are expected to work with your classmates, share ideas, discover together, and learn from each other. However, you must adhere to the following rules:

- Clearly indicate your partners' name(s) at the beginning of all collaborative work;
- Distribute work fairly with each person making an equal contribution to all parts;
- Everyone writes his or her own notes, observations, calculations, analysis, reports, etc.;
- Everyone turns in his or her own lab report.

### **Students With Disabilities**

Students with documented disabilities who believe that they will need classroom and/or testing accommodations are encouraged to contact the Disability Resource Center in the Student Union, room 210, 257-3020 as close to the beginning of the semester as possible. The DRC will provide forms verifying the need for accommodations for you to deliver to your instructor. Reasonable accommodations will be put into place once the instructor receives the form.

### **Course Content and Schedule**

The schedule of the class is determined by the weather each week. Below is a list of activities that we may do over the course of the semester. We will not complete all of these activities.

#### **Indoor:**

- Introduction to Starry Night
- Angles and Parallax
- Revolution of the Moons of Jupiter
- Reflecting Telescopes
- Refracting Telescopes
- Properties of Telescopes
- Spectroscopy 101
- Direct and Retrograde Motion
- Hubble Redshift-Distance Relation
- Determining the Velocity of a Comet

#### **Outdoor:**

- Motions I: The Night Sky
- Motions II: Celestial Motions
- Targeted Observing Exercise 1
- Targeted Observing Exercise 2
- Constellations
- The Moon
- Properties of Telescopes