

# Syllabus - Spring 2014 Observational Astronomy

## PHYS-UA 13

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### 1 Overview

This course will teach you how to observe the sky carefully with your naked eye, binoculars, and a small telescope. You will learn the basics of observable lunar and planetary properties, and the basics of astronomical coordinates and observations. The goal is for you to be able to understand and describe what you see in the sky at night, and to be able to use charts and coordinates to predict it.

### 2 Textbooks

The primary textbook is “The Cosmos - Astronomy in the New Millenium”, by Pasachoff and Filippenko. In addition, we will use the “Edmund Mag 5 Star Atlas” as well as the “Peterson Field Guide to the Stars and Planets”, by Jay Pasachoff. This course will teach you how to understand and use these two books. Two other useful texts (not mandatory, but useful if you want to learn more) are Kaler’s “The Ever-Changing Sky” and Shu’s “The Physical Universe - An Introduction to Astronomy”.

### 3 Logistics

Each week you will attend one lecture (at 3:30 pm Monday in Meyer 102) and one lab. Arrive for the lab (on time!) at 6:20 pm in Meyer 224, where we will discuss the contents of the lab and then (when appropriate) go to the observatory. The lab schedule is uncertain; except for the first (indoor) lab, the timing of the indoor and outdoor labs for each section will be driven mostly by the weather. Welcome to observational astronomy! Also note that you are signed up for one of the two lab sections, and cannot change off, because the two lab section get unsynchronized due to the weather.

For each lecture, there is a sheet of homework questions to answer. These are due at the beginning of the next lecture. These questions will be similar to those on the midterm and the final.

### 4 Labs

For the labs: you MUST arrive on time, or else you will not be able to access the observatory. In addition, please dress appropriately for remaining outside for an extended period, including hats and gloves when appropriate. Remember, this is not like walking to class you are going to be standing outside relatively still for almost two hours. Dress warmly! Attendance in lab is not optional! You can miss one lab during the semester without penalty: you must however contact the lab instructor explicitly to claim this credit. If you are absent for any other without good cause you will lose credit for that lab. If you miss more than three sessions without good cause, you will not be given a passing grade no matter how you perform in the class otherwise.

## 5 Grading

Grades are based on labs (25%), homeworks (15%), the midterm (25%) and the final (35%).

## 6 Lecture and Reading Schedule

- *Jan 27*: Introduction, Distances and Angles, Coordinates  
(The Cosmos - Ch. 1, 4; Edmund pp. 1-9; Peterson pp. 495-498; Celestial Coordinate Systems handout)
- *Feb 3*: Constellations, Types of Objects, Locating Objects  
(The Cosmos - Ch. 1; Edmund pp. 10-17; pp. 30-32; Peterson pp. 1-26; pp. 32-38; pp. 46-50; pp. 126-129)
- *Feb 10*: Telescopes and the EM Spectrum  
(The Cosmos - Ch. 2, 3; Peterson pp. 503-508)
- *Feb 17*: President's Day - No class
- *Feb 24*: Orbits, Motions, Newton's and Kepler's Laws  
(The Cosmos - Ch. 5)
- *Mar 3*: The Motion of the Earth: Time, Precession, Eclipses  
(The Cosmos - Ch. 4, 5)
- *Mar 10*: Midterm Exam - In class
- *Mar 17*: Spring Break - No class
- *Mar 24*: The Solar System I - The Planets  
(The Cosmos - Ch. 6, 7; Peterson - Ch 9, 10)
- *Mar 31*: The Solar System II - Moons, Comets, Asteroids  
(The Cosmos - Ch. 8; Peterson - Ch 11, 12)
- *Apr 7*: Stars I - Distances, Magnitudes, HR Diagram  
(The Cosmos - Ch. 10, 11; Peterson pp. 144-167)
- *Apr 14*: Stars II - Structure, Evolution  
(The Cosmos - Ch. 12, 13, 14)
- *Apr 21*: Galaxies - Structure, Types, Evolution  
(The Cosmos - Ch. 15, 16, 17; Peterson pp. 168-184)
- *Apr 28*: Cosmological Distances, Redshifts, Dark Matter, Gravitational Lensing  
(The Cosmos - Ch. 16, 18, 19)
- *May 5*: Exoplanets  
(The Cosmos - Ch. 9)
- *May 12*: Cosmology  
(The Cosmos - Ch. 16, 18, 19)
- *May14(Tentative)*: Final Exam