PH 104 - Descriptive Astronomy - Syllabus

Instructor

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Course Information

Winter 2017
CRN: 31477
Time: Mon, Wed 8:30-10:50
Room: BC 207

Welcome to Astronomy!

Our universe is constant changing as is our understanding of it. In this course, we will explore many features of our universe including planets and moons, stars, galaxies, and black holes. We will learn about historical ideas, astronomical tools, scientific models, and recent discoveries.

In this course, you will develop and improve skills such as problem solving, critical thinking, oral communication, and group work. I also hope the class increases your curiosity, confidence, and knowledge base so that you continue to learn about our universe throughout your life.

Prerequisites

MTH 075 Variables and Linear Equations or equivalent with a grade of "C" or better. Completion of college level reading and writing is recommended for success.

Course Materials

1. Text: OpenStax Astronomy, by Fraknoi, Morrison, Wolff
   This is an open, educational resource and is available online for free. Paper copies are also available.
2. PH104 Lab Manual, LBCC 2017
3. Access to Sapling for Astronomy, our online homework, ISBN 978-1-3191-5935-1
   - Sapling account log-in: https://www.saplinglearning.com/ibiscms/login/
   - Sapling registration instructions: https://community.macmillan.com/docs/DOC-5972-sapling-learning-registering-for-courses
4. Optional: Non-graphing, non-programmable scientific calculator

Student Learning Outcomes

1. Solve scientific problems with quantitative methods.
2. Describe the physical nature of the universe at the atomic, planetary, stellar, and galactic scales.
3. Explain how light is used by astronomers to study the universe.
4. Describe key events in the history of science, with particular emphasis on astronomy, and their impact on society.
5. Describe and apply the process of scientific inquiry.

Grading

Midterm Exams	25%
Final Exam	25%
Reading Quizzes	10%
Labs	20%
Homework	15%
Class Activities	5%

Final Grade Calculation

A	90 – 100 %
B	80 – 89 %
C	70 – 79 %
D	60 – 69 %
F	< 60 %

Exams: For each exam you will take an individual test, followed by a group test. Exam 1 covers weeks 1-3 and exam 2 covers weeks 4-6. The final exam covers the entire course, with emphasis on weeks 7-10.

Reading Quizzes: I provide reading guides throughout the term. You will fill these out and bring them to use on the reading quizzes. Reading quizzes cannot be made up but I will drop your lowest score.

Lab exercises: You will complete nine labs in small groups. Bring your lab manual to class on lab days. Some lab reports are completed individually, and sometimes the entire group collaborates on one lab report.

Homework: You will complete weekly assignments through Sapling Learning. These are ***due each Sunday at 10pm***. Late homework is not accepted.

Class Activities: We will spend much of class time collaborating and solving problems as scientists in groups. I will grade selected in-class assignments using a basic rubric (2 points = complete, 1 point = incomplete, 0 points = not turned in).

Make up work: I generally do not allow any makeup work. However, because situations are sometimes out of our control, I adapt your lab and reading quiz scores so that you may miss one of each without a penalty. The lowest quiz score is dropped and the lowest lab score counts as extra credit. You cannot get credit for other in-class activities that you miss. If you want to complete them for your own benefit, please ask and I will provide you with the materials if I can.

Your responsibilities

- A huge amount of the learning in this course happens during class. Complete the reading assignments in advance, and **come ready to participate**.
- **Respect** your instructors and your classmates, and we will return the favor. Respect includes arriving on time, turning off your cell phone, listening, and contributing.
- Check the Moodle website regularly to stay updated with current class information.
- This class is highly collaborative; however, there are also expectations for individual work. Any cheating, plagiarism, or other violation of the Student Code of Conduct may result in a zero and possible recommendation to the administration for further consequences.
- Students who may need accommodations due to documented disabilities, who have medical information that I should know, or who need special arrangements in an emergency should speak with me during the first week of class. If you believe you may need accommodations but are not yet registered with CFAR, please visit the CFAR website at www.linnbenton.edu/cfar for steps on how to apply for services or call 541-917- 4789.

My responsibility

I am here to help you learn! Only you can do the learning, but expect me to be available for help during class and office hours and to facilitate the learning process.

ASTRONOMY CLASS SCHEDULE

Wk	Read	Monday	Wednesday
1	1.1-1.5, 2.1, 2.2, 2.4	Class Overview Scientific Inquiry **LAB**: **What's in the Box**	Constellations History of Astronomy **ACTIVITY: heliocentric vs. geocentric, viewing the sky**
2	3.1-3.4, 4.6 **skip Interpretation of Newton's laws and Orbital Measurement*	**NO CLASS** Holiday	**Reading Quiz #1** Planetary Motion Gravity **LAB: Kepler's Laws**
3	4.2, 4.3, 4.5, 4.7, 5.1-5.3 **skip page 160*	**Reading Quiz #2** Seasons, Lunar Phases Eclipses **ACTIVITY: sun, earth, moon**	Light and Spectroscopy **LAB: Spectral analysis** **ACTIVITY: electromagnetic spectrum, blackbody radiation**
4	7.1, 7.2	**EXAM 1**	Solar System: Overview **LAB: Our Solar System**
5	6.1-6.3, 8.3, 10.1, 10.3, 11.1, 11.2, 13.3, 14.1	**Reading Quiz #3** Planets **ACTIVITY: radar, travel time**	Telescopes Asteroids and Comets **LAB: Telescopes**
6	9.1, 9.2, 12.1-12.3, 21.4, 21.5, 15.1-15.3, 16.2, 16.3	**Reading Quiz #4** Moons Exoplanets **ACTIVITY: moons, Doppler shift**	The Sun **LAB**: **Parallax** **ACTIVITY: sunspots**
7		**NO CLASS** Holiday	**EXAM 2**
8	17.1, 17.2, 18.4 21.1, 22.1, 22.4, 23.1– 23.3 **skip Magnitude Scale*	**Reading Quiz #5** Measuring Stars **LAB: H-R diagrams**	Life Cycle of Stars Supernovae **ACTIVITY: radius of stars, writing about stars**
9	23.4, 24.1 – 24.5, 24.7, 19.2	**Reading Quiz #6** Pulsars Relativity and Black Holes **ACTIVITY: special relativity**	Black Holes Gravitational Waves **LAB: Cepheid Variables**
10	25.1, 25.3, 26.1, 26.2, 26.5, 29.5	**Reading Quiz #7** The Milky Way Galaxies **ACTIVITY: size of milky way**	Cosmology **LAB: Expansion of the Universe**
			FINAL EXAM 8:00 – 9:50pm