Welcome to Astronomy 1: The Astronomical Universe

Astro 1 is an introduction to the wonders of the universe, focusing on qualitative understanding of the night sky and humanity's place in the cosmos. During this semester, we'll learn about everything from asteroids to black holes, which definitely sounds achievable in six weeks. We will explore the history and development of astronomy as a science, and examine past and current debates and controversies in astronomy.

Instructor: Steve Kerby (he/him)
Email: Canvas messages or sek289@psu.edu
Open Help Session (Student Drop-In): 532C Davey Lab or on Zoom, MTWTF 12:00-1:00 and 3:20-4:30, or by appointment

Class Meeting Location: 106 Wartik Lab
Class Meeting Time: MTWTF 1:25PM-3:20PM
Course Dates: 29 June 2022 - 10 Aug 2022
Course Credits: 3

Final Exam: Friday, August 12th

Required Textbook: None

In this course, our goals are...

1. To appreciate the history and practice of astronomy since ancient times.
2. To apply mathematical laws to make physical predictions about the universe.
3. To understand the motion of objects in the sky, including the Sun, Moon, planets, and stars.
4. To explore how diverse objects in the universe relate to life here on Earth.
5. To become scientifically-literate citizens who consume science news with a critical eye.
6. To apply the scientific method of investigation, discussion, and experimentation.

Big Questions:

- How has the study of astronomy evolved over the centuries?
- Why and how does the night sky change from day to day?
- What are planets, stars, and galaxies?
- How do physics and math help us make predictions about the universe?
- What does astronomy suggest about the past and future of our planet and the universe?
- What is humanity's place in the universe? Are we alone?

Assignments and Grades

Your grade is determined with...

- 40% Homework
- 20% Midterm Exams (10% each)
- 20% In-Class Mini-Checkpoints
- 5% Pre-Class Knowledge Checks
- 15% Final Exam

…with the standard PSU grading scale.

Grading Philosophy: The purpose of graded assignments is to help us (you and me inclusive) evaluate your learning with feedback and corrections. In all assignments and exams, I am interested in your learning process and your approach to solving problems. Partial credit will always be given when you have solved parts of a problem correctly.

Homework is due by the start of class on the day indicated on each assignment, preferably in person, but alternatively via an emailed PDF or in the submission box by my office. Late homework is marked down 20% of the total score for each day late. Most weeks on Thursday we'll go over homework answers and discuss problems. There are six homeworks throughout the semester, but only the **best five** are counted towards your final grade.

The **Midterms** and the **Final** are cumulative, closed-book, in-person exams to help you review material and evaluate your learning. The midterms are during normal class time, the final is on August 12th (time/place TBD).

In-Class Mini-Checkpoints are small quizzes on the lecture material taken during the lecture itself, or discussion questions based on in-class activities or demonstrations. Questions will also be paired with small group discussions and opportunities to provide your own insight and thinking to the class. I'll provide submission slips at the start of each lecture.

Pre-Class Knowledge Checks are brief reflections to complete before each (full) week of classes. These are graded only for completion, using a Canvas assignment that should only take ~10 minute. The PCKC (pronouced "Pkkkkkkk") will ask you about your prior knowledge on topics we'll cover in the upcoming week, and help me tailor activities and lectures for your previous learning level. They are also great for asking me about topics you are curious about.

Schedule

This schedule is tentative, and may change over time.

Week of	Lectures, Assignments, & other Shenanigans
Wednesday, 29 June (NOTE: First day of class is Wednesday)	#0: Astronomy: Science and Scale #1: The Night Sky and How It Works **HW#1 Due Friday the 1st**
Tuesday, 5 July (NOTE: No class on July 4th)	#2: The Solar System and the Planets **HW#2 Due Monday the 11th**
Monday, 11 July	#3: Stars and Stellar Evolution **HW#3 Due Monday the 18th** **Midterm #1 on Friday the 15th**
Monday, 18 July	#4: Galaxies **HW#4 Due Monday the 25th**
Monday, 25 July	#5: Life, the Universe and Everything **HW#5 Due Monday the 1st**
Monday, 1 August	#6: Frontiers of Astronomy **HW#6 Due Monday the 8th** **Midterm #2 on Friday the 5th**
Monday 8 August (NOTE: Last day of class is Wednesday)	#7: Astronomy and You **FINAL EXAM: Friday the 12th (time/place TBD)**

School-Life Balance

Many students face obstacles as a result of work or family obligations or due to outside difficulties. If you are experiencing challenges that are impacting your ability to succeed, please reach out to me so we can work together to form a plan for your academic success in this course.

Attendance Policy

Attending class in person is the best way to learn the material, as discussions with your peers cannot be replicated remotely. The In-Class Mini-Checkpoints serve as "attendance" credit towards your final grade, but I do not take attendance directly. If you need to catch up, please get in contact with me so I can help by sending along lecture recordings.

Academic Integrity

Astronomy is a collaborative science, and I strongly encourage you to discuss homework problems with your peers or friends. Working together in groups is both a critical skill for scientific progress, and a valuable personal habit. Even if you work with a group of other students on homework, the **final submission you turn in should be your own work in your own words**. In scientific work, **we always credit our collaborators**. If you work closely with other students, you should credit them in your submission.

I strongly suggest collaborating on the homework assignments with your peers. You are welcome to discuss problems, brainstorm different ideas, and help each-other. **However, your final submitted work should be uniquely your own,** and you should credit your peers where you have collaborated.

Copying another student's work or using their words for your own answers without crediting them is plagiarism, which is cheating. In this class there will be no warnings, even on a first offense. The tests in this class are closed notes, closed book, closed electronics, and closed web.

University Resources

Penn State welcomes students with disabilities into the University's educational programs. If you have a disability-related need for reasonable academic adjustments in this course, contact the Office of Student Disability Resources (SDR). You must contact SDR and request academic adjustment letters at the beginning of each semester.

Lectures will be recorded, so that students who are unable to join the lectures live can view them later. Penn State lawyers want me to tell you: *Video and audio recordings of class lectures will be part of the classroom activity. The video and audio recording is for educational use/purposes and will be made available to all students presently enrolled in the class.*