

Syllabus

Course Description

The course provides a description of modern astronomy including the structure and evolution of planets, stars, galaxies, and the Universe. We will begin our exploration right here on Earth and seek to understand the nature of the ground on which we stand and the sky above. From here we will examine the history of how we came to our current place in astronomy and the developments in scientific thought along the way. Then we will take a tour of our own Solar System and investigate its main component, the Sun. We will explore the lives and deaths of stars, learning some mind-bending physics along the way as we discover exploding stars, neutron stars, and black holes. We will journey further from home into the realm of the vast conglomerations of stars known as galaxies. We will examine the Universe as a whole and ask what it's like on the largest scales and how it evolved. Finally, we will indulge in some scientific speculation on the existence of life and the future of the Cosmos.

The live, in-person class will consist of four 1-hour Zoom meetings per week. I will provide lecture slides, a video lecture, and some optional additional reading for you to review and study prior to each live class. Then, during the Zoom sessions we'll discuss some of your thoughts and questions about the lecture material. I will be experimenting with ways to use videoconferencing features to help you better engage with the course content, your fellow students, and me.

Questions outside of class are also welcome. I encourage you all to come to my virtual office hours on Thursdays, where I will just be hanging out on Zoom waiting for you to drop by if you wish. Come with any questions you may have, be they on homework, lecture material, readings, or astronomy in general. Come just to listen to what questions your fellow students are asking. Or just come if you are feeling chatty. Try and come toward the beginning so that we have enough time to cover everyone's questions.

Course Goals

The typical person has the impression that astronomy--and science in general--is a body of facts, handed down from authority figures. That is simply not the case. Science is a *process*; it is a very human endeavor to understand the natural world. A major goal is for you to understand *how* this process works and to appreciate the work that scientists do. It isn't important that you memorize facts or calculations, but rather that you learn the methods and logic that lead to them.

Also, I hope that your perception of, and curiosity about the world around you will become more fully developed. For example, when you go outside and look up at the daytime sky, I would like you to notice that the sky is blue, and then wonder about *why* it is blue. Why is the night sky dark? What are the stars? How far away are they? Asking the question is the first step in finding the answer.

Textbook

There is no required text for this class. I will provide lecture notes via the class website and give suggested readings from the internet to supplement class lectures.

Grades and Academic Policies

Your total course grade will consist of 5 parts

10% Class Participation

Classes will be as interactive as I can reasonably make them. I strongly believe that the best learning happens when you feel an active part of the class and are not merely passively sitting, listening, and taking notes. We will spend a lot of time together during the 6 short weeks of this session. I will attempt to actively involve each of you in the Zoom sessions. Your participation in class will therefore be worth a percentage of your total grade.

25% Homework Sets

There will be homework sets once per week which will consist of multiple choice, short answers, and quantitative problems. They will be due at the end of the day on Fridays (except for on Exam weeks, where they will be due on Thursdays). Homework is intended to keep you on track with this fast-paced course and help you to better understand the class material.

20% Class Projects

You will be required to do 3 projects over the course of the 6 weeks. These projects range from simple labs and sky observations, to writing reviews of science fiction movies, to reading and reporting on popular news media stories about astronomy. You may choose any 3 (and only 3) that you like. But, you must do at least 1 lab. Make sure that the total points they are worth add up to 60. They will be due on Friday in weeks #2, 4, and 6. These are meant to be fun. Enjoy watching the movies and thinking about how such crazy things could be. Enjoy getting outside to observe the beautiful sky. Take them seriously and don't procrastinate on them, and have some fun.

20% Midterm Exam

There will be one midterm exam. It will take place online, on Thursday of week #3 during the lecture time. It will cover all the material through Lecture 11. It will consist of multiple choice questions and your choice of short essays or an oral examination.

25% Final Exam

The final exam will take place in class on the last day of classes. It will be comprehensive and again consist of multiple choice and your choice of short essays or an oral exam.

Grading Scheme

Grades are meant as an assessment of your mastery of the subject material. They are not a judgement of your character or work ethic.

The grading scheme will be on an absolute scale that follows the break-down in the table below. 100% percent will be in most cases 100% of the points possible on a given assignment or exam. Should the class as a whole do particularly poorly on an assignment or exam, and I am convinced that everyone gave their best efforts, I will examine the grade distribution and set 100% at a reasonable value.

If you are taking the class pass/not pass be aware that you must earn a grade of at least a C- (70%) in order to pass the class.

Percentage (%)	Letter Grade	Grade Point
95-100	A	4.0
90-94	A-	3.7
86-89	B+	3.3
83-85	B	3.0
80-82	B-	2.7
77-79	C+	2.3
74-76	C	2.0
70-73	C-	1.7
67-69	D+	1.3
64-66	D	1.0
60-63	D-	0.7
< 60	F	0.0

Academic Conduct

Science does not happen in a vacuum and neither does learning. As such, you are encouraged to work together on your homework sets and labs (if possible). But please turn in your own work in your own words.

Plagiarism or other forms of academic dishonesty really only harm you. Any work that is found to have been done dishonestly will be given no credit.

UC Berkeley Harassment or Discrimination Policies

The University of California strives to prevent and respond to harassment and discrimination. Engaging in such behavior may result in removal from class or the University. If you are the subject of harassment or discrimination there are resources available to support you. Please contact the Confidential Care Advocate (sa.berkeley.edu/dean/confidential-care-advocate[Links to an external site.](#)) for non-judgmental, caring assistance with options, rights and guidance through any process you may choose. Survivors of sexual violence may also want to view the following website: survivorsupport.berkeley.edu[Links to an external site.](#).

For more information about how the University responds to harassment and discrimination, please visit the Office for the Prevention of Harassment and Discrimination website: ophd.berkeley.eduLinks to an external site.

Land Acknowledgement

The University of California at Berkeley is located in Huichin, the ancestral and unceded land of the Chochenyo Ohlone people, the successors of the historic and sovereign Verona Band of Alameda County. We acknowledge that we benefit from the use and occupation of this land. We recognize and honor the importance this land is to the Ohlone people and offer our respects to the Ohlone ancestors.