

# Astr 545: Astrophysics of Stars and Planets

Spring 2021

Tuesday – Thursday 11:00 - 12:15,

<https://arizona.zoom.us/j/84430910882>

## • Course Description

In this class, we will study the structure and evolution of stars and planets.

We will be exploring a very large range of physical theories and processes. However, we will concentrate on the physical ideas and their applications, without sacrificing rigor and detail. The prerequisite for this class is a good understanding of classical mechanics, electrodynamics, fluid mechanics, and radiative transport.

## • Learning Outcomes

By the end of this class you will

- be familiar with the foundations as well as the state-of-the-art modeling techniques related to the structure of stars and planets.
- be able to apply the theory of structure and evolution of stars and planets to address modern research problem in the field.
- be able to use observations of stars and planets and infer the underlying physical properties of them (e.g., ages, masses, rotational states, presence of winds).

## • Textbooks

There is no recommended textbook for this class. We will be using different chapters from various books (all of which are available through the library) as well as recent review articles.

## • Assignments

There will be **two** different types of assignments in this class, each of which will help you improve different types of skills that you will need in your careers.

**(i) Homework:** this will require solving detailed, quantitative problems that will involve analytic calculations, simple numerical calculations, statistical inferences, etc. There will be 5 sets of homeworks, about once every two weeks. The due dates for the homework will be on Tuesdays, at the beginning of class.

The homework will count for 50% of the class grade.

**(ii) Project:** the final assignment will help you develop strategies in literature searching and in distilling the important information from the large amount of published papers available. It will be a term project on a subject related to the material in the class. Your goal will be to review a topic, write a 10-15 page review paper on it, and present your findings in a 15 min talk in front of the class. This will count for 50% of the grade.

There will be no midterm or final exams. There will be no credit for late assignments.

A total score of 90% will guarantee an A. However, the final distribution of scores will determine the exact grade breakdown.

All material for the class, including homework sets, will be available on d2l.

- **Contact**

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Office hours: by appointment.

- **Policies**

**Attendance.**— Class attendance is optional. Please come to class only if you find it useful. However, if you do come to class, please give your full attention and participate in the discussion. Moreover, you are responsible to learn of any announcements I make in class, which may or may not appear on the web page.

All holidays or special events observed by organized religions will be honored for those students who show affiliation with that particular religion,

**Absences.**— Absences (or difficulty turning in assignments on time) that are pre-approved by the UA Dean of Students (or Dean's designee) will be honored.

There will be make up assignments only with a well documented, serious, and valid excuse, such as a serious sickness, death in the family, or a university function.

**Academic Integrity.**— Cheating or any other form of unethical or threatening behavior will not be tolerated. You can find more information on these issues in the following two web sites of the university:

<http://deanofstudents.arizona.edu/policies-and-codes/code-academic-integrity>

<http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students>

**Accessibility and Accommodations.**— At the University of Arizona we strive to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on disability or pregnancy, you are welcome to let me know so that we can discuss options. You are also encouraged to contact Disability Resources (520) 621-3268 to explore reasonable accommodation. Please be aware that the accessible table and chairs in this room should remain available for students who find that standard classroom seating is not usable.

**Incompletes.**— Incompletes will only be given if a student has satisfactorily completed the majority of the work in the class and has a valid reason, such as medical, for not completing the remainder of the course. Students must make arrangements with the instructor in order to receive an incomplete.

Other than grade and absence policies, the information contained in this syllabus may be subject to change with reasonable advance notice.