

**ASTRONOMY 545 – Stars and Accretion
Fall 2017**

Class meets: T/Th 1:00-3:00

Classroom: Steward Observatory Room 208

Instructors:

Dr. Josh Eisner
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Office Hours:

We will have dedicated office hours on Wednesdays from 2-4 pm. We are also available by appointment, and students should feel free to stop by other times.

Course Description

This course focuses on the application of physics to stars and accretion disks. We will cover classic topics as well as areas of active research. This includes the formation of stars, their properties while on the main sequence, and post-main-sequence evolution. We will also discuss accretion processes in circumstellar disks and other astrophysical systems. Given the intertwined nature of planet and star formation, and the similar physics governing stellar and planetary structure, we will also cover basic planet formation, structure, and evolution in this course. Fundamental microphysics, including equations of state, opacities, fluid dynamics and magnetohydrodynamics will be covered with an emphasis on their broad applicability to problems of astrophysical interest.

Textbook

The main textbook for the course is “Stellar Interiors” by Hansen, Kawaler, and Trimble. This book covers most of the topics in stellar structure and evolution. Topics in accretion and fluid dynamics will be drawn from other sources, including “Physics of Astrophysics, Vol. 2” by Shu and “Accretion” by Frank, King, and Raine. We will also draw from the scientific literature in some cases, and will provide links or copies of papers where appropriate.

Lectures

Lectures will be held twice a week, with two-hour sessions that each include a 20 minute break. A typical two-hour class session will consist of about 1 hour of lecture and 40 minutes of interactive activity. The interactive activities will

include group problem solving, student presentation of current topics related to the course, and guided computational work. We expect all student to participate in these activities.

Homework and Classwork

There will be approximately six homework assignments during the semester, due *at the beginning of class on Thursdays*. Homework will consist of “individual” and “group” problems. Individual problems should be attempted by each student, without consultation with others. However, after an initial attempt, students are free to consult with the professors or their peers if difficulties are encountered. Each student must turn in his or her own copy of the homework, and should include the names of those with whom he or she worked. Note also that some of the assignments will include computational components. Interactive time in Tuesday’s class may be used for homework problems.

Exams

There will be one mid-term examinations as well as a final exam. These exams will cover material discussed in lecture as well as in the homework.

Grading

The grades for the course will be computed as follows:

Homework	40%
Student Presentations	10%
Midterm Exam	20%
Final Exam	30%

Grades may be adjusted to reflect overall class performance.

Topic Schedule and Corresponding Reading

A rough schedule of topics and readings is given on the course website. As the semester progresses, the schedule will be updated to reflect actual progress.

Course Website

<http://www.u.arizona.edu/~jeisner/astr545/>

Absence and Class Participation Policy

The UA’s policy concerning Class Attendance, Participation, and Administrative Drops is available at: <http://catalog.arizona.edu/policy/class-attendance-participation-and-administrative-drop>. The UA policy regarding absences for any sincerely held religious belief, observance or practice will be accommodated where reasonable, <http://policy.arizona.edu/human-resources/religious-accommodation-policy>. Absences pre-approved by the UA Dean of Students (or Dean Designee) will be honored. See: <https://deanofstudents.arizona.edu/absences>

Academic Integrity

Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, graded work/exercises must be the product of independent effort unless otherwise instructed. Students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog. See: <http://deanofstudents.arizona.edu/academic-integrity/students/academic-integrity>.

Students with Disabilities

Our goal in this classroom is that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, please let me know immediately so that we can discuss options. You are also welcome to contact the Disability Resource Center (520-621-3268) to establish reasonable accommodations. For additional information on the Disability Resource Center and reasonable accommodations, please visit <http://drc.arizona.edu>.

Threatening Behavior Policy

The UA Threatening Behavior by Students Policy prohibits threats of physical harm to any member of the University community, including to oneself. See <http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students>.

UA Nondiscrimination and Anti-harassment Policy

The University is committed to creating and maintaining an environment free of discrimination; see <http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy>

Information contained in the course syllabus, other than the grade and absence policy, may be subject to change with advance notice, as deemed appropriate by the instructors.