

ASTR 495: Stellar Structure & Evolution

Fall 2012

Instructor:

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office hours: walk-in anytime or by appointment

Textbook:

Hanson, Kawaler, & Trimble, “Stellar Interiors: Physical Principles, Structure, and Evolution”, Springer, 2004 (2nd edition)

The publishers have included supplementary online material for this textbook at <http://extras.springer.com/2004/978-0-387-20089-7>. Please download this material for use during the course.

Grading:

Homework – 75%
Research Paper – 25%

Attendance is strongly recommended but not required. Every assignment must be turned in to receive a passing grade for the course. Late homework will be penalized by 10% per day late, without a valid excuse. If you have a valid excuse, we will agree upon a reasonable deadline to complete the work.

Academic Integrity:

I do not mind if you collaborate with other students or use outside references on homework assignments. There are many resources available to help you learn the material. However, copying work from other students or outside sources is considered plagiarism. Any student found to have engaged in academic misconduct on a graded assignment or exam may be assigned a zero for that assignment, assigned an F in the course, and/or reported to the Dean of Students.

Accommodations for Students With Disabilities:

If you have a disability for which you are or may be requesting accommodations, please contact both your instructor and the Office of Academic Support Services, University Center 212 (610-758-4152) as early as possible in the semester. You must have documentation from the Academic Support Services office before accommodations can be granted.

Tentative Schedule:

- Aug. 30 No class – Professor out of town
- Sept. 6 Preliminaries – physics, timescales, etc. (Ch. 1)
Independent reading: Stellar evolution (Ch. 2)
- Sept. 13 Preliminaries (cont.), Equations of state (Ch. 3)
Independent reading: Stellar evolution (cont.)
- Sept. 20 Equations of state (cont.)
- Sept. 27 Energy transport: radiation and conduction, opacity (Ch. 4)
- Oct. 4 Energy transport: convection (Ch. 5)
- Oct. 11 Energy transport (cont.)
- Oct. 18 Stellar energy sources (Ch. 6)
- Oct. 25 Stellar energy sources (cont.), Stellar modeling (Ch. 7)
- Nov. 1 Stellar modeling (cont.)
- Nov. 8 Asteroseismology: radial and nonradial pulsations (Ch. 8)
- Nov. 15 Asteroseismology (cont.), Structure and evolution of the Sun (Ch. 9)
- Nov. 22 No class – Thanksgiving
- Nov. 29 Sun (cont.), Stellar magnetic fields
- Dec. 6 Rapid rotation and rotational mixing
- Dec. 14 **Research paper due**