

AST 731, Fall 2008

Stellar Interiors

Professor: Daniel Proga, Department of Physics and Astronomy, UNLV
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 Class time: Monday/Wednesday 1:00-2:15 pm, BPB 247
 Reference Book: *Stellar Interiors* by C.J. Hansen, S.D. Kawaler and V. Trimble
 Website: <http://www.physics.unlv.edu/~dproga/AST731F08.html>
 Office hours: Formally the office hours are on Tuesday from 1:30 pm to 2:30 pm in my office (BPB Rm. 240). However, feel free to stop anytime with questions/problems/suggestions.

Week	Date	Subject	Reading
1	Aug. 25	Overview	Ch. 1
	Aug. 27	Preliminaries	Ch. 1
2	Sept. 1	Labor Day Recess	
	Sept. 3	An Overview of Stellar Evolution I	Ch. 2
3	Sept. 8	An Overview of Stellar Evolution II	Ch. 2
	Sept. 10	An Overview of Stellar Evolution III	Ch. 2
4	Sept. 15	An Overview of Stellar Evolution IV	Ch. 2
	Sept. 17	Equation of State I	Ch. 3
5	Sept. 22	Equation of State II	Ch. 3
	Sept. 24	Equation of State III	Ch. 3
6	Sept. 29	Radiative and Conductive Heat Transfer I	Ch. 4
	Oct. 1	Radiative and Conductive Heat Transfer II	Ch. 4
7	Oct. 6	Heat Transfer by Convection I	Ch. 5
	Oct. 8	Heat Transfer by Convection II	Ch. 5
8	Oct. 13	REVIEW	
	Oct. 15	Mid-term exam	
	Oct. 20	Stellar Energy Sources I	Ch. 6
	Oct. 22	Stellar Energy Sources II	Ch. 6
10	Oct. 27	Stellar Energy Sources III	Ch. 6
	Oct. 29	Stellar Modeling I	Ch. 7
11	Nov. 3	Stellar Modeling II	Ch. 7
	Nov. 5	Stellar Modeling III	Ch. 7
12	Nov. 10	Astroseismology I	Ch. 8
	Nov. 12	Astroseismology II	Ch. 8
13	Nov. 17	Astroseismology III	Ch. 8
	Nov. 19	Structure and Evolution of the Sun	Ch. 9
14	Nov. 24	Structure and Evolution of White Dwarfs	Ch. 10
	Nov. 26	Review and Discussion	
15	Dec. 1	Review and Discussion	
	Dec. 3	Summary	
116	Dec. 8	Student Presentation	
	Dec. 10	Student Presentation	

Course description:

This is an astrophysics course for astronomy major graduate students. It is a survey course designed to introduce the students to the basic concepts and principles of stellar structure and the microphysics of the equation of state, opacity, and nuclear reactions. Stellar evolution will be examined using semi-quantitative approaches. This course is worth 3 credits.

Grading:

The course grade will be based on homeworks, a numerical problem assignment, a mid-term exam, and a presentation.

- There will be five homeworks during the semester. Each homework will be worth 5 pts. (the total of 25 pts can be earned from homeworks). You may use any available materials to solve the problems. You are also encouraged to discuss the problems with each other, while you are trying to solve homework problems, with the provision that after the discussions you must write up your solutions yourself, independently from anyone else. This rule will be taken very seriously under the UNLV honor system. In particular, it should be stated in the submitted solutions who you have discussed the problems with (as a form of acknowledgements).
- Each student will be given a problem to be solved using numerical methods. It is to master a concept/idea and use a computer to generate a numerical solution of a specific problem. There will 20 pts. to be earned from this.
- Each student will be assigned to read one or more research papers related to this course. Some additional thinking and possible ideas of research projects are encouraged. Each student will give an hour presentation at the end of the semester. 30 pts will be assigned for reading / presentation.
- The mid-term exam is on October 15. There will be 5 problems each worth 5 pts. (i.e., the total of 25 pts can be earned). No printed materials are allowed during the exam.
- Final Letter grades will be assigned according to the numerical scores (100 total).
A (≥ 85), A- (80-84),
B+ (77-79), B (73-76), B- (70-72)
C+ (67-69), C (63-66), C- (60-62)
D (50-59)
F (< 50)

Other information:

- The UNLV Disability Resource Center (DRC) houses the resources for students with disability. If you have a documented disability that may require accommodations, you will need to contact the DRC for the coordination of services. The DRC is located in the Student Services Complex (SSC), Room 137. Their numbers are: VOICE (702) 895-0866, TTY (702) 895-0652, FAX (702) 895 0651. For additional information please visit: <http://studentlife.unlv.edu/disability>.
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- Students UNLV e-mail account (RebelMail) is one of the primary ways students will receive official university communication – information about deadlines, major campus events, and announcements. All UNLV students receive a RebelMail account after they have been admitted to the university. For more information, see at <http://rebelmail.unlv.edu/>.