Stars: Stellar Structure and Evolution
A1120

Class Meets:

Tu, Th 11:00 am - 12:15 pm

Thaw 210

Instructor:

Prof. D. John Hillier

318 Allen Hall

412-624-9213

hillier@pitt.edu

When emailing me, you MUST include A1120 in the subject matter of the email:

e.g., Query regarding Q1, HW 1 (A1120).

Do NOT email asking trivial questions that can be answered using a few minutes of your time.

Office Hours

Monday 11:00 – 12:00

By appointment --- EMAIL me providing several alternate dates & times.

Any time I'm in my office and free.

Course Description:

Observational properties — distances, luminosities, temperatures; Binary stars — orbits, stellar masses; Stellar atmospheres — radiative transfer, spectra formation, spectral lines; Stellar structure — hydrostatic and thermal equilibrium, energy generation, opacities, nucleosynthesis; Stellar evolution — formation and death of stars, protostars, main-sequence, red giants, planetary nebulae, supernovae; Stellar remnants — white dwarfs, neutron stars, and black holes.

Lectures:

27 lectures (+ 1 mid term exam + 1 exam during finals week)

Stars: Stellar Structure and Evolution

Text Book:

An Introduction to Modern Astrophysics (2nd edition)
Bradley W. Carroll & Dale A. Ostlie
Addison-Wesley Publishing Company
ISBN 0-8053-0402-9

Course Outline:

The Continuous Spectrum of Light:	Ch. 3
The Interaction of Light and Matter:	Ch. 5
Binary Stars and Stellar Parameters:	Ch. 7 (& 2)
The Classification of Stellar Spectra:	Ch. 8
Stellar Atmospheres:	Ch. 9
The Interior of Stars:	Ch. 10
The Sun:	Ch. 11
Interstellar Medium & Star Formation:	Ch. 12
Main-Sequnce & Post-Main Sequence Evolution:	Ch. 13
(Stellar Pulsation:	Ch. 14)
The Fate of the Most Massive Stars	Ch. 15
The Degenerate Remnants of Stars:	Ch. 16
GR & Black Holes:	Ch. 17
(Close Binary Systems:	Ch. 18)

Stars: Stellar Structure and Evolution

Other Texts

Introduction to Stellar Astrophysics

E. Böhm-Vitense

Cambridge University Press

Basic Stellar Observations and Data (Vol. 1)

Stellar Atmopsheres (Vol. 2)

Stellar Structure and Evolution (Vol.3)

An Introduction to the Theory of Stellar Structure and Evolution

D. Prialnik,

2000, Cambridge University Press,

The Physics of Stars (2n ed.)

A. C Phillips

Wiley (2008)

CourseWeb

Use of CourseWeb (Blackboard) will be made during the term.

You should familiarize yourself with CourseWeb immediately.

Assignments will posted on CourseWeb on a regular basis.

Announcements regarding reading exercises etc will also be placed on CourseWeb.

During the term you will receive EMAIL at your PITT account. If you don't receive an EMAIL from me by the second lecture, you need to see me. Please ensure that your MAIL box is not full.

Important Dates

Friday 6th Sept. – End Fall-term add/drop

Monday 14th Oct. – Fall break

Tuesday 15th Oct. – Monday classes

27 Nov. to 1. Dec. – Thanksgiving

Friday 6th Dec. -- Last day of classes

Stars: Stellar Structure and Evolution

Exams

Mid Term:	Thursday, October 17
Final:	Saturday, 14 December: 8:00 — 9:50 am

Grades

Based on exams, homework and class participation

Mid Term:	25%
Final exam:	45%
Homework & project:	25%
Class participation:	5%

The instructor reserves the right to adjust this distribution slightly.

Homework / Project

The homework will consist of both problem sets and essay style questions. The homework is an important part of the grade and must be taken seriously. **Late homework will NOT be accepted without my prior approval**.

You may discuss homework with each other, **but the presentation and working on the homework must be your own.** Where there is evidence of copying (e.g., same simple numerical error) **both** homework will receive zero. Repeated offenses will result in an F for the course, and a note will be sent to the Dean.

Homework:

- Solutions must NOT be written on the homework sheet, and separate pages MUST be stapled.
- In general, it is useful to write a clear statement of the problem before commencing its solution.
- Answers must be neat and readable. Often this will mean that you need to rewrite your solution. Scrawl will not be graded.
- All working needed to get to the final result must be shown. However I do not need to see invalid working.
- All units must be clearly shown.
- Marks will be deducted if you give an absurd answer and don't comment. If you obtain an absurd answer you must include a comment (especially in an Exam), and come and see me.