

AST 341: Stars and Radiation

Syllabus — Fall 2026

Lecturer

Prof. Will M. Farr

Contact

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- Course materials: [Brightspace](#)

Class Times

M, W 0930-1050, Social and Behavioral Sciences S328

Office Hours

W 1400-1700, or by appointment, ESS 457B

Course Textbook

An Introduction to the Theory of Stellar Structure and Evolution, Dina Prialnik (Second Edition, Cambridge University Press, 2010). ISBN 978-0-521-86604-0. **Required**; we follow its structure closely and work problems from it.

Stellar Interiors, Carl J. Hansen, Steven D. Kawaler, and Virginia Trimble (Second Edition, Springer Verlag, 2013). ISBN 978-1-461-26497-2. This text is at a more advanced level than Prialnik, and could be useful for students who want to go deeper into the subject. It is not required.

Course Description

An introduction to, and development of, a firm physical understanding of the observed properties of stars. Topics include the structure of the interior and atmosphere of stars, the transfer of energy by radiation in plasmas, the evolution of stars, and the end stages of stellar evolution, including white dwarfs, neutron stars, black holes and supernovae, with careful attention to the comparison of the predictions with observations.

Course Grade

- **70% Problem Sets.** Assigned periodically; at least one week each. Late submissions incur 10% per day. The lowest two scores are dropped before averaging the rest equally. Announced and submitted via [Brightspace](#).
- **30% Final Project.** In place of an exam, with a significant research component, due during the final exam period. Topic and modality set in consultation with the instructor. Examples:
 - A simulation code that models the structure and evolution of a (simplified) star.
 - An analysis that uses archival data to measure the properties of a stellar population and compares to theoretical predictions based on models in class.

- A lecture or pedagogical paper on a topic in stellar structure or evolution that extends and enhances the material covered in class, at a deeper level.

Grading Scale

A 93–100; A– 90–92; B+ 87–89; B 83–86; B– 80–82; C+ 77–79; C 74–76; C– 72–73; D+ 70–71; D 60–69; F 0–59.

These are thresholds only; final cutoffs may be **lowered** based on course difficulty, never raised. A 93% total guarantees at least an A.

Collaboration and AI Policy

The goal of this course is for you to come to understand the physics of stellar structure, evolution, and radiation and their central place in modern astronomy. You are free (encouraged!) to collaborate with your classmates, consult the literature, browse the internet, use AI chatbots or code generators, and so on; and to discuss the material with anyone you like as you pursue this understanding. Ultimately, you are responsible for any material you submit for grading, and you should be able to demonstrate that you understand it if asked. Submitting material that you do not understand, whether by copying from a classmate, the internet, or other source (e.g. generative AI), is a violation of the University Academic Integrity Policy and can result in referral to the academic judiciary.

Student Accessibility Support Center Statement

If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact the Student Accessibility Support Center, Stony Brook Union Suite 107, (631) 632-6748, or at sasc@stonybrook.edu. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential. Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and the Student Accessibility Support Center. For procedures and information, visit Environmental Health and Safety.

Academic Integrity Statement

Each student must pursue their academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Professions, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website.

Critical Incident Management

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Student Conduct and Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of

Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.

Accessibility

Stony Brook University is committed to ensuring a supportive, inclusive, and equitable learning environment for all members of our community, which includes upholding the principles of [Title II of the Americans with Disabilities Act \(ADA\)](#). As a student in this course, it is important to recognize your role in ensuring that all classmates, including those who use assistive technologies, can fully engage with and comprehend the course content. Therefore, any digital materials you create and share, such as assignments, presentations, or shared documents, must be designed to be digitally accessible using the most up to date version of the [WCAG 2.1 Level AA guidelines](#). Accessible practices include, but are not limited to, providing alternative text for images, using clear heading structures, and ensuring captions for any video or audio you incorporate. Guidance and assistance in making your digital content accessible can be found on the [Accessibility Resources for Students](#) page. For additional support, please visit [Deque University](#).

Understand When You May Drop This Course

If you need to drop or withdraw from the course, it is your responsibility to be aware of the tuition liability deadlines listed on the registrar's [Academic Calendar](#). Before making the decision to drop/withdraw you may want to contact me or refer to the University's policies on [undergraduate course load and course withdrawal policy](#).

Incomplete Policy

Under emergency/special circumstances, students may petition for an incomplete grade. Circumstances must be documented and significant enough to merit an incomplete. If you need to request an incomplete for this course, contact me for approval as far in advance as possible. You should also read the University's [undergraduate incomplete policy](#).

Course Materials and Copyright Statement

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