

AST 341: Astronomy / Fall 2018

Instructor: Prof. Michael Zingale, ESS 452, michael.zingale@stonybrook.edu
Class Meeting Time/Place: Tues. and Thurs., 8:30 am to 9:50 pm, location: Frey 217

Learning Outcomes

Students will study the formation, evolution, and death of stars including their classification scheme; nuclear and neutrino processes; the emission, absorption and transport of radiation; and the stellar atmosphere.

Prerequisite

AST 203, PHY 251/252, MAT 203 or 211 or 307 or AMS 261. It is very important that you have the necessary prerequisites—we will assume a knowledge of mechanics from your physics class. Any other material needed from physics will be introduced during the course.

Course Website / Syllabus

The syllabus and all course material/class announcements will be available on the AST 341 Blackboard webpage.

Office Hours

Tues. 2:00 to 4:00 pm; *Thurs.* 2:00 to 3:00 pm

It is not possible to pick office hours that can accommodate the schedule of all students in this class. You are encouraged to contact the instructor to make an appointment outside of these times, or just come by the office.

Textbook

The required text is *An Introduction to the Theory of Stellar Structure and Evolution, 2nd Ed.* by Dina Prialnik (Cambridge). This is at the appropriate mathematical level for our course.

Homework

Homework is an essential part of this class. There will be 7–9 homework assignments throughout the course. Not all assignments will carry the same weight—point values for each problem will be indicated on the assignment. Students will typically have 1 week to complete an assignment. While it is recognized that students sometimes work together and discuss the homeworks as part of the learning process, *what you turn in must be your own work. Copying will not be tolerated.*

Homeworks are due at the time/date listed on the assignment. Late homeworks received within 24 hours of the due date/time will be assessed a 20% penalty. *No late homeworks will be accepted after that 24-hour window.*

Homework grades will be posted to the Blackboard gradebook approximately 1 week after the due date, and the graded assignments will be returned in class. Students should report any errors/missing grades promptly. At the end of the semester, a total homework percentage will be computed by adding up the number of points you received and dividing by the total possible points.

Exams

There are two midterms and a final exam. The midterms will focus on the material since the previous exam. The final will cover the entire course. For each of the exams, students are responsible for knowing the material presented in the lectures, recitations, assigned as homework, and in the assigned chapters of the text. Students are expected to come to class on-time on exam days.

Students should not expect that they will be allowed to make up an exam. Reasons for wanting to make-up an exam will be judged on a case-by-case basis. Students wanting to make up an exam must have a *valid* excuse (e.g. athlete in University-related sporting event, jury duty, medical emergency), notify the instructor *before* the scheduled exam, and be prepared to provide documentation supporting their excuse. *No make-ups will be allowed more than one week after the original exam date.*

Final Exam

According to the University Registrar (<http://www.stonybrook.edu/commcms/registrar/registration/exams.html>), the final exam is scheduled for Wed., Dec. 12 from 11:15 am to 1:45 pm. *In the event of a discrepancy between what is listed here and what is on the Registrar's site, the date/time given by the Registrar will be used.*

Any changes to the time, as well as the location of the exam will be announced in class toward the end of the semester. The final exam will be cumulative. *All students must take the final exam at the scheduled time.*

Course Schedule

| # | month | day | Prialnik Ch. | topic | HW assigned | HW due ¹ |
|--------|-------|-----|---|----------------------------------|-------------|---------------------|
| 1 | Aug. | 28 | 1 | Introduction | — | — |
| 2 | Aug. | 30 | 2 | Equations of stellar evolution | 1 | — |
| 3 | Sep. | 4 | 2 | Equations of stellar evolution | — | — |
| 4 | Sep. | 6 | 3 | Gas and radiation | 2 | 1 |
| 5 | Sep. | 11 | 3 | Gas and radiation | — | — |
| 6 | Sep. | 13 | 4 | Nuclear processes | — | — |
| 7 | Sep. | 18 | 4 | Nuclear processes | 3 | — |
| 8 | Sep. | 20 | 5 | Equilibrium models | — | — |
| 9 | Sep. | 25 | 5 | Equilibrium models | — | 3 |
| 10 | Sep. | 27 | Exam # 1 | | | |
| 11 | Oct. | 2 | 6 | Stability | — | — |
| 12 | Oct. | 4 | 6 | Stability | 4 | — |
| — | Oct. | 9 | Fall break | | | |
| 13 | Oct. | 11 | 7 | Stellar evolution | — | — |
| 14 | Oct. | 16 | 7 | Stellar evolution | — | 4 |
| 15 | Oct. | 18 | 8 | Mass loss | 5 | — |
| 16 | Oct. | 23 | 8 | Mass loss | — | — |
| 17 | Oct. | 25 | 9 | More stellar evolution | 6 | 5 |
| 18 | Oct. | 30 | 9 | More stellar evolution | — | — |
| 19 | Nov. | 1 | 10 | Supernovae, pulsars, black holes | — | 6 |
| 20 | Nov. | 6 | Exam # 2 | | | |
| 21 | Nov. | 8 | 10 | Supernovae, pulsars, black holes | — | — |
| 22 | Nov. | 13 | 11 | Interacting binary stars | 7 | — |
| 23 | Nov. | 15 | 11 | Interacting binary stars | — | — |
| 24 | Nov. | 20 | 12 | Stellar life cycle | 8 | 7 |
| — | Nov. | 22 | Thanksgiving break | | | |
| 25 | Nov. | 27 | 12 | Stellar life cycle | — | — |
| 26 | Nov. | 29 | — | Stellar atmospheres | 9 | 8 |
| 27 | Dec. | 4 | — | Stellar atmospheres | — | — |
| 28 | Dec. | 6 | — | Review | — | 9 |
| finals | Dec. | 12 | Final exam (all course material) | | | |

Note: the homework schedule is tentative and subject to change.

Lecture Notes

The lecture notes used in class complement, but do not replace the course texts. *You are responsible for any information in the assigned readings that is not covered in the lectures. The course notes are intended for AST 341 students only.*

Assigned Reading

Each lecture in the course schedule has chapter numbers listed next to it for both texts—this is your assigned reading. Students are expected to have read the assigned chapters in the required text before the corresponding lecture. Occasionally we will not cover a few sections in a chapter—this will be pointed out in class.

Course Grade

The final grade will be based on the homeworks, midterms, and final exam using the following weighting:

- homework: 30%
- midterms: 40% (equally weighted)
- final exam: 30%

Computed this way, the overall course grade will range from 0–100. Any extra credit points (up to 2 total) will then be added. Letter grades will be based on a standard grade scale (i.e. an overall score > 90/100 would be an A- or better). However, if necessary, a curve will be applied to the overall course grade, considering the overall performance of the class. Students who wish to discuss their grades or class performance should see the instructor in person. *For privacy reasons, grades will not be discussed via e-mail or phone.*

Student Accessibility Support Center Statement

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Student Accessibility Support Center, ECC (Educational Communications Center) Building, Room 128, (631) 632-6748. They will determine with you what accommodations, if any, 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 Student Accessibility Support Center. For procedures and information go to the following website: <http://www.stonybrook.edu/ehs/fire/disabilities>.

Academic Integrity

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, 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 at http://www.stonybrook.edu/commcms/academic_integrity/

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 Judicial Affairs 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.

Electronic Communication

Email to your University email account is an important way of communicating with you for this course. For most students the email address is 'firstname.lastname@stonybrook.edu'. *It is your responsibility to read your email received at this account.* For instructions about how to verify your University email address see this:

<http://it.stonybrook.edu/help/kb/checking-or-changing-your-mail-forwarding-address-in-the-epo>

You can set up email forwarding using instructions here:

<http://it.stonybrook.edu/help/kb/setting-up-mail-forwarding-in-google-mail>

If you choose to forward your University email to another account, we are not responsible for any undeliverable messages.

Religious Observances

See the policy statement regarding religious holidays at http://www.stonybrook.edu/commcms/provost/faculty/handbook/employment/religious_holidays_policy.php

Students are expected to notify the course professors by email of their intention to take time out for religious observance. This should be done as soon as possible but definitely before the end of the 'add/drop' period. At that time they can discuss with the instructor(s) how they will be able to make up the work covered.