

# ASTR 300B Radiation & Matter 2021 Syllabus

Live Online MWF 12-1pm (Sec. 1), 2-3pm (Sec. 2)



**Instructor: Dr. Yancy Shirley**

**[yshirley@arizona.edu](mailto:yshirley@arizona.edu)** (include "ASTR300B" in title)

**Office Hours: Tu, Th 1-5pm via Zoom (email me to join)**

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**Course Description:** ASTR 300B is a class studying the physical processes that emit, absorb, and scatter light in the context of the astrophysics of the interstellar medium. In this class you will learn radiative transfer in one dimension, learn the fundamental physics of thermal and non-thermal emission processes in the interstellar medium, and learn the basics of atomic and molecular spectroscopy.

**Co-requisites:** Completed ASTR 300A and have completed or are currently taking PHYS 331 (E&M I) and PHYS 371 (Quantum Mechanics I).

### **Course Learning Outcomes:**

Upon completion of this course, you will be able to:

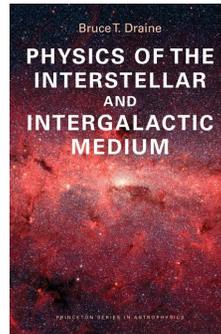
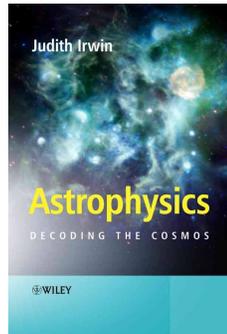
1. Demonstrate the ability to meaningfully analyze, apply and integrate the principle findings, common applications, current problems, fundamental techniques, and underlying theory of the astronomy discipline.
2. Employ discipline skills related to the observational techniques, instrumentation, computational methods, and software applications used to investigate modern astrophysical phenomena and problems.
3. Participate in the scholarly, ethical, and discipline specific practices of the field at an emergent level.

### **Stay in communication**

Emergencies and life circumstances happen, especially during this pandemic! Please contact me ([yshirley@arizona.edu](mailto:yshirley@arizona.edu) ; include ASTR 300B in the email subject line) if you know you will miss a class or cannot turn in a homework and we can work out a solution. Please communicate with me during the semester – I will help you to succeed!

**Equipment and software requirements:** For this class you will need daily access to the following hardware: computer or web-enabled device with a webcam and a microphone; regular access to reliable internet signal; and ability to participate on Zoom.

**The two reference textbooks (optional) for the course are:**



**Grading:** Homework (67-100% - you decide)      Final Exam (0-33% - you decide)  
The final grade maximum scale is set at: A(>88%), B(>75%), C(>62%), D(>50%).

Your grade in this course will depend on your performance on the homework (67-100% of total) and the final exam (0-33% of total). We will be working on homework in class during the 12-1pm (Section 1) and 2-3pm (Section 2) time periods. *Please only attend the class section that you are signed up for.* Homework assignments are due at the beginning of class and may be turned in by replying directly to the email in which they are sent as an attachment (either take a photo with your phone/tablet/computer or save as a pdf). Please do not send a separate email. Grades for homework may be disputed up to one week after they have been graded. If you incorrectly solve a homework problem, I will email you suggestions and you may correct the problem and turn it back in for half additional credit within the next week (reply to the original email). Please be reasonable – don't turn-in a bunch of homework to re-grade near the end of the semester. I will not be handing out solutions to the homework – it is expected that you will solve all of the problems yourself. The final homework score for the class is the average of all homework problem grades. You have the choice of how much homework will count for your final grade in this class between 67% and 100% of the total. This effectively means the final exam is optional and if you decide to take it, then you can decide how much it will count toward the final grade (up to 33%; you chose this percentage on the final exam). There will be a poll sent the final week of class where you will decide if you will take the final. The final exam is open-note meaning you will be allowed to use your notes, old homework, and books/readings for the class. The final exam will take place during the regularly scheduled time for your section.

Requests for incomplete (I) or withdrawal (W) must be made in accordance with University policies, which are available at <http://catalog.arizona.edu/policy/grades-and-grading-system#incomplete> and <http://catalog.arizona.edu/policy/grades-and-grading-system#Withdrawal> respectively.

## Collaborative Learning

Active engagement in collaborative learning activities during class is *expected*. You are encouraged to share intellectual views and discuss freely the principles and applications of course materials. Modern science is collaborative, and people learn from talking to each other. However, graded work/exercises must be the product of independent effort unless otherwise instructed. What this means specifically for our class is: Do your own work for homework assignments and the final exam. Feel free to talk to the instructor or other students about homework assignments. We will have in-class collaborative homework assignments where you are strongly encouraged to work together *during* the class period. However, don't just copy someone else's solutions. Always write up your own solutions. *Using or copying homework solutions from previous year's class is cheating. Sharing homework solutions (for instance on a Discord server, by email, etc.) is cheating.* If there is cheating on a homework, then the final exam will be mandatory and count 33% of the final grade while homework will count 67%. Copying is cheating and will be handled according to the university policies. The repercussions for those found guilty of violating the Code will include loss of credit for the work, a mandatory final exam (33% of grade), and may include failure of the course. Students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog. See: [https://deanofstudents.arizona.edu/sites/deanofstudents.arizona.edu/files/code\\_of\\_academic\\_integrity.pdf](https://deanofstudents.arizona.edu/sites/deanofstudents.arizona.edu/files/code_of_academic_integrity.pdf)

## Class attendance

The UA policy regarding absences for any sincerely held religious belief, observance or practice will be accommodated where reasonable, <http://policy.arizona.edu/human-resources/religious-accommodation-policy>. Absences pre-approved by the UA Dean of Students (or Dean Designee) will be honored. See <https://deanofstudents.arizona.edu/absences>

If you feel sick, or may have been in contact with someone who is infectious, stay home. Except for seeking medical care, avoid contact with others and do not travel. Notify me if you will be missing an online course. Campus Health is testing for COVID-19. Please call (520) 621-9202 before you visit in person. Visit the UArizona COVID-19 page for regular updates. There is no need for a medical excuse to be provided for absence of up to one week. Students who need to miss more than one week of classes in any one semester will be required to provide a doctor's note of explanation to the **Dean of Students**. The Dean of Students Office will communicate the receipt of the note (with expected end date) out to the relevant faculty, and instructors are responsible for determining adjustments or modifications as appropriate. I will work out a plan with you for you to catch up.

**Life challenges:** If you are experiencing unexpected barriers to your success in your courses, please note the Dean of Students Office is a central support resource for all students and may be helpful. The Dean of Students Office can be reached at 520-621-2057 or [DOS-deanofstudents@email.arizona.edu](mailto:DOS-deanofstudents@email.arizona.edu).

**Physical and mental-health challenges:** If you are facing physical or mental health challenges this semester, please note that Campus Health provides quality medical and mental health care. For medical appointments, call (520-621-9202). For After Hours care, call (520) 570-7898. For the Counseling & Psych Services (CAPS) 24/7 hotline, call (520) 621-3334.

### **Classroom Behavior Policy**

To foster an equitable learning environment, students and instructors have a shared responsibility. We want a safe, welcoming, and inclusive environment where all of us feel respected and comfortable with each other and where we voice our ideas and challenge ourselves. To that end, our focus is on the tasks at hand and not on extraneous activities (i.e. texting, chatting, reading a newspaper, making phone calls, web surfing, etc). We ask that you come to class ready to fully engage and work collaboratively everyday! We also ask that you respect your fellow classmates and their learning.

### **Threatening Behavior Policy**

The UA Threatening Behavior by Students Policy prohibits threats of physical harm to any member of the University community, including to one's self. See: <https://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students>

### **Accessibility and Accommodations**

Our goal in this classroom is that learning experiences be as accessible, equitable and as inclusive as possible. If you anticipate or experience physical or academic barriers based on disability, please let me know so that we can discuss options. You are also welcome to contact Disability Resources (520-621-3268) to establish accommodations. For information on Disability Resources and reasonable accommodations, please visit: <http://drc.arizona.edu/>

If you have reasonable accommodations, please plan to meet with me by appointment or during office hours to discuss accommodations and how my course requirements and activities may impact your ability to fully participate.

### **UA Nondiscrimination and Anti-harassment Policy**

The University is committed to creating and maintaining an environment free of discrimination, <http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy>

Our classroom is a place where everyone is encouraged to express well-formed opinions and their reasons for those opinions. We also want to create a tolerant and open environment where such opinions can be expressed without resorting to bullying or discrimination of others.

### **Legal Statement on Lecture Recordings**

For lecture recordings, which are used at the discretion of the instructor, students must access content in D2L. Students may not modify content or re-use content for any purpose other than personal educational reasons. All recordings are subject to government and university regulations. Therefore, students accessing unauthorized recordings or using them in a manner inconsistent with UArizona values and educational policies are subject to suspension or civil action.

### **Additional Resources for Students**

UA Academic policies and procedures are available at:

<http://archive.catalog.arizona.edu/2015-16/policies/aaindex.html>

Student Assistance and Advocacy information is available at:

<http://deanofstudents.arizona.edu/student-assistance/students/student-assistance>

The University of Arizona provides a wide variety of resources to help you feel more at home in the UA environment. Examples of student resource/cultural centers include:

- The African-American Student Center
- The Asian & Pacific American Student Center
- The Guerrero Student Center
- The Immigrant Student Resource Center
- The LGBTQ+ Student Center
- The Native American Student Center
- The Transfer Student Center
- The Veterans Education and Transition Services Center
- The Women & Gender Resource Center

We encourage you to take advantage of the community, support, and learning opportunities afforded by these centers, and to encourage your friends and colleagues to do the same.

### **Subject to Change Statement**

Information contained in the course syllabus, other than the grade and absence policy, may be subject to change with advance notice, as deemed appropriate by the instructor.