

**Syllabus for ASTR 170B (The Physical Universe)**  
**Spring 2021 – Fully Online**  
Dr. Peter Milne

**Class:** Online, with modules running generally from Tuesday → Monday

**Instructor Info:**

**Office Hours:** by appointment

**Office:** 486

**Phone:** 626-5731

**email:** [pmilne@as.arizona.edu](mailto:pmilne@as.arizona.edu)

**General Information:** This course explores the science of astronomy, including the history, the physics, the instruments used and the scientific method. After establishing the methods of astronomy, the course studies the planets, stars, galaxies and the universe as a whole.

**Instructor Access:**

The primary method to contact Dr. Milne is through emails. Dr. Milne will respond to your emails within ~24 hrs, including weekends. We monitor the Discussion-Help area, and you'll see us engaging in your discussion assignments when needed. We do monitor all discussion areas, even if you don't see us post.

Office hours are available by appointment, via emailing Dr. Milne. An exam review will precede each exam, with the dates and method of interacting shown in the modules.

**Grading Policy:**

The grade is based upon a 1000 point scale

- 2 Exams worth 120 & 130 points (250 total)
- 22 homework assignments worth 15 points each...drop low 2 (300 total)
- 3 Projects worth 30/40/55 points each (125 total)
- 16 Activities worth 15 points each drop low 1 score (225 total)
- One Intro and Six regular Discussions worth 10 or 15 points (100 total)
- 2 Extra Credit assignments worth 15 points each (30 total)

**Required Textbook & MasteringAstronomy:**

This course will use the textbook, “The Cosmic Perspective” 9<sup>th</sup> Edition by Bennett, Donahue, Schneider and Voit. Homework will be performed within MasteringAstronomy, which is synced with the textbook. These resources will be accessed within the D2L site. A separate email will be sent explaining how to register, and the instructions will be posted as a class announcement.

**Exams:**

- There will be one Midterm exam and one Final Exam. The Midterm exam will be worth 120 points, the final will be worth 130 points.
- Each Midterm Exam covers the first two sections of the text.
- Exam dates: Module 4 and Module 8, available the entire week.
- If an exam date possess problems, the student must contact the instructor to request early access to the exam. If the request is not received and acknowledged before the exam, no make-up will be offered, and a zero awarded for that exam.

**Homework:**

- There are 24 Chapters in the textbook and there are 22 homework assignments. All but two chapters will have one homework assignment.
- Homework will be performed on the Mastering Astronomy website, within D2L.
- The lowest 2 homework scores will be dropped, meaning that  $15 \times 20 = 300$  homework points will count towards the course grade.
- Make-up homework will not be accepted. This will be enforced by the software. The first missed assignment will automatically become the low 1 dropped.

**Projects:**

- There will be three (3) projects assigned during the course.
- One project, “Astronomy in Arizona”, can be worked on as a group, but each student is responsible for submitting their answers.
- One project, “Science & Policy”, is considered an individual project. This means that the work must be performed without any assistance from classmates.

- One project, “Astronomy in the News” is considered an individual project. This means that the work must be performed without any assistance from classmates.
- The projects will be worth 30, 40 & 55 points, leading to a total of 125 project points.

**Activities:**

- Throughout the semester, there will be sixteen (16) in-class activities. Each lab is worth 15 points.
- The activity consists of answering questions based upon the material presented, and will typically be composed of filling in answers on a worksheet and then submitting those answers via D2L or a dedicated website.
- The low one activity will be dropped, leading to 225 Activity points.

**Class Schedule:**

The course will be taught in four parts, with an exam after each two parts. There are many aspects to astronomy, making it impossible to suitably cover every subject over the duration of a one-semester course. Although I encourage all interested students to take additional courses to learn about favorite topics in detail, I understand that for most, this course will be their only college course in astronomy. For that reason, I have decided to cover the entire range of the textbook’s topics, rather than limit the topics. The trade-off is that individual topics will be simply introduced, rather than explored in great detail. Four projects will be assigned to allow detailed, individual/group investigation of topics of the student’s choosing.

**The Four Parts of the course are:**

**Part #1: Basics of Astronomy: Chapters 1-6**

(Terminology, History, Laws of Motion, Scientific Method, Light and Telescopes)

**Part #2: Solar System: Chapters 7-13**

(Formation, Terrestrial planets, planetary atmospheres, asteroids, comets)

**Part #3: Stars: Chapters 14-18**

(Sun, stellar properties, supernovae, white dwarfs,

neutron stars, black holes)

## **Part #4: Galaxies & the Universe: Chapters 19-24**

(Galaxy types, galaxy structure, cosmology, dark matter, ET)

### **Course Prerequisites:**

Courses: There are no prerequisite courses or content knowledge for this course.

Math: You will encounter formulae and ratios for which an understanding of basic algebra and basic geometry is useful. A level of at least high school senior math is expected. There will be tutorials and resources to help you if you need assistance.

Online learning: You are not required to have taken a fully online course prior to enrolling in ASTR170B1. If you have concerns or trouble with being a fully online student, please contact Dr. Milne.

### **Technology/Computing Skills**

We use many different web-enabled tools in this course. You should be comfortable using a web browser, clicking links to navigate online, using a search tool, downloading and opening files, and comfortable navigating new web spaces by examining where to click/submit/etc. Additionally, you will be asked to use a word processing program to complete the project and activities. There are videos and podcasts in this course for which you need audio/speakers/headphones as well as interactive activities where you play with the content/questions/animations online.

If you have technology trouble during the course please visit/call the OSCAR Help Desk site for information:

<http://uits.arizona.edu/departments/the247>

If you have further problems, please email your instructor(s).

### **Your Learning Community:**

Even though you may not be sitting physically next to your classmates you are still a class of students learning together. We want to encourage a positive learning community where you can:

- ask questions freely in office hours and the 24x7 Meeting Place
- feel comfortable asking for help from classmates or instructors in discussion forums

- can freely email the instructors when you need help
- feel welcome during any and all office hours For some Activities you will be collaborating with classmates. If you encounter difficulty with this, please let us know so we can help.

We'll also be asking you periodically how you are doing with the course content so we can help clear up sticking points. Each week there will be feedback surveys with questions like "What is your muddiest point this week?" so we can help you along the learning journey. We'll also guide the discussion assignments and group work.

We expect everyone in the class to abide by and encourage your peers to follow the UA's Student Code of Conduct. This includes general rules of netiquette, being polite in online discussions, no flaming/teasing, no swearing/cursing, and being mindful and tolerant that everyone has their own personal belief system and is due full respect. If you feel you are being mistreated or you see a fellow student acting inappropriately, please notify us immediately.

### **Important Policies:**

Core Rules of Netiquette <http://www.albion.com/netiquette/corerules.html>

UA Student Code of Conduct:

<http://deanofstudents.arizona.edu/policiesandcodes/studentcodeofconduct>

### **Course Components:**

Detailed descriptions are contained in the Course Components page in **D2L > Content > Course Information > Course Components.**

### **Course Format:**

Our course runs on a weekly schedule, Tuesday (first day) – Monday (last day). There is one module per week. Module assignments are due the last day of the module (Mon) at 11:59pm MST.

All times listed in the syllabus and for due dates/class times are Mountain Standard Time, which is Arizona local time. Figure out the conversion.

The Midterm & Final Exams will be released early morning seven days before the due date and will remain open until midnight MST on the due date. They will open for you to take at any time, but you are restricted to a 2 hour time limit for taking the exam.

Being a 7 and ½ -week session we cover 3 weeks of fall/spring semester content in each weekly module. You should expect to devote 2-3 hours per day to course activities M-F and additional hours over the weekend. There are STRICT deadlines for items being due and no late assignments are accepted without a Dean of Students note or other such item (verifiable doctor's note, death in the family, etc.)

Please find the detailed Course Schedule in D2L > Content > Course Information > Course Schedule

If you need a DRC accommodation, please contact Dr. Milne as soon as possible.

### **Computer/Software Requirements:**

This course is fully online and you will need a computer with internet access. Not all course materials will be viewable or usable on handheld devices or tablets (iPad, etc.). You will need to use either Mozilla Firefox or Microsoft Internet Explorer for your web browser as those are supported by our UA D2L tech support. You should also make sure your JAVA, Adobe Flash Player, and Adobe Shockwave Player are up to date. You will also need Quicktime for videos/podcasts and a PDF reader. You can use any "office suite" you like, though we prefer Microsoft Word, Microsoft Powerpoint, OpenOffice (free), or Google Docs. For Office Hours and live meeting places we use D2L Online Rooms (Elluminate Live!) which may require a temporary Java file download. Lectures are broadcast via iTunes which can be used on a PC or Mac, streamed live, or downloaded for offline viewing.

Mozilla Firefox (PC and Mac): <http://www.mozilla.org/en-US/firefox/new/>

Internet Explorer (PC): <http://windows.microsoft.com/en-US/internet-explorer/products/ie/home>

JAVA update: <http://java.com/en/>

Adobe Flash Player: <http://get.adobe.com/flashplayer/> Adobe

Shockwave Player: <http://get.adobe.com/shockwave/>

Quicktime: <http://www.apple.com/quicktime/download/>

Safari (PC and Mac): <http://www.apple.com/safari/download/>

Adobe PDF Reader: <http://get.adobe.com/reader/>

Open Office (Free): <http://www.openoffice.org/>

Zoom: <https://zoom.us>

**Assessment & Grades:**

- \* Grading is absolute and there will be no curves.
- \* There are no late Homework, Assignments or Discussions accepted.

TOTAL COURSE POINTS 1000

1 Extra Credit Assignment

+15 possible

**COURSE POINT TOTALS**

A: 900-1000 points

B: 800-899 points

C: 700-799 points

D: 600-699 points

F: 599 and below

**Department of Astronomy Undergraduate Program Learning Outcomes:**

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. Develop proficiency with communicating, translating and interpreting fundamental astronomical concepts and research results in oral and/or written formats.
4. Conduct guided research and/or develop mastery-knowledge of a specific area of the discipline of astronomy.
5. Participate in the scholarly, ethical, and discipline specific practices of the field at an emergent level.

**ACADEMIC DISHONESTY:**

Presentation of any work other than your own is considered academic dishonesty. This includes copying test answers or homework assignments, other persons taking exams for you, or reference to any unauthorized materials during the exam. Any other technique that gains unfair advantage over other students is also considered academically dishonest. Any incidents of academic dishonesty will be dealt with according to the University of Arizona's Code of Academic Integrity. A copy of this Code can be obtained at the Dean of Students website. The consequences can range from loss of credit on an assignment to dismissal from the University, depending on the severity of the offense. The penalty for plagiarism, cheating on an exam, computer fraud, or having someone use your UA NetID to access the fully online course will be automatic failure of the course, and depending on the circumstances, I may seek your suspension or expulsion. You can find details of the Code at:

<http://deanofstudents.arizona.edu/codeofacademicintegrity>

**Official Policies and Procedures:**

The following sections are University of Arizona Board of Regents policies and procedures that will be adhered to in this course. Please review the Code of Academic Integrity, Student Code of Conduct, and the Non-Discrimination & Anti-Harassment Policy. Any and all interactions between students, instructors, teaching staff, and course managers – everyone involved in this online course – will follow these policies. If you witness a violation of a policy or are a victim of a policy violation, please report it appropriately with the default/information source to be the Dean of Students Office at the UA-Tucson campus.

**Code of Academic Integrity:**

The UA Code of Academic Integrity prohibits all forms of academic dishonesty, including cheating, plagiarism, and fabrication; all students should be familiar with it and follow it in this class. The Code also informs faculty, teaching staff, and students on the procedures and due process for violations of the Code. Please review the full Code of Academic Integrity here:

<http://deanofstudents.arizona.edu/codeofacademicintegrity>

Tips for avoiding Academic Dishonesty:

<http://deanofstudents.arizona.edu/tipsforavoidingacademicdishonesty>

**Student Code of Conduct Philosophy:**

The aim of education is the intellectual, personal, social, and ethical development of the individual. The educational process is ideally conducted in an environment that encourages reasoned discourse, intellectual honesty, openness to constructive change, and respect for the rights of all individuals. Self-discipline and a respect for the rights of others in the university community are necessary for the fulfillment of such goals. The Student Code of Conduct is designed to promote this environment at each of the state universities. The Student Code of Conduct sets forth the standards of conduct expected of students who choose to join the university community. Students who violate these standards will be subject to disciplinary sanctions in order to promote their own personal development, to protect the university community, and to maintain order and stability on campus.

Find the full Student Code of Conduct here:

<http://deanofstudents.arizona.edu/policiesandcodes/studentcodeofconduct>

**Non-Discrimination and Anti-Harassment Policy:**

The University of Arizona is committed to creating and maintaining an environment free of discrimination, harassment, and retaliation that is unlawful or prohibited by University policy. The University prohibits discrimination, including harassment and retaliation, by University employees, students, contractors, or agents of the University and by anyone participating in a University sponsored activity against an individual based on a protected classification. Protected classification includes race, color, religion, sex, national origin, age, disability, veteran status, sexual orientation, gender identity, or other protected category. The University also prohibits retaliation because an individual has engaged in a protected activity.

The University will take prompt and appropriate action to: (1) thoroughly investigate complaints under this policy; and (2) prevent, correct and, if necessary, discipline individuals who engage in behavior that violates this policy in accordance with University policies. All members of the University community are responsible for participating in creating a campus environment free from all forms of prohibited discrimination and for

cooperating with University officials who investigate allegations of policy violations. See the full policy here: [http://equity.arizona.edu/non-discrimination\\_anti-harassment](http://equity.arizona.edu/non-discrimination_anti-harassment)

**University Resources:**

Even though you are an online student, you are still a student of the University of Arizona and a member of the UA community. Even at a distance you may need help and assistance so please do not hesitate to contact on-campus departments. Here is a list you may find helpful:

Dean of Students: <http://deanofstudents.arizona.edu/>

Campus Health: <http://www.health.arizona.edu/>

Counseling and Psychological Services:  
<http://www.health.arizona.edu/caps.htm>

Office of Instruction and Assessment: <http://oia.arizona.edu/>

University Information Technology Services: <http://www.uits.arizona.edu/>

LGBTQ Affairs: <http://deanofstudents.arizona.edu/LGBTQaffairs/home>  
UA Parents and Family Programs: <http://uafamily.arizona.edu/>

Student Advocacy and Assistance:  
<http://deanofstudents.arizona.edu/studentassistanceandadvocacy>

Women's Resource Center: <http://wrc.arizona.edu/>

Disability Resource Center: Disability is an aspect of diversity that is integral to our society and to the University of Arizona campus community. The Disability Resource Center collaborates with students, faculty and staff to create educational environments that are usable, equitable, sustainable and inclusive of all members of the university community. However, if you encounter academic or physical barriers on campus, DRC staff is available to partner with you in finding good solutions or to implement reasonable accommodations. If you need DRC resources or accommodations, please see the DRC website for contact information: <http://drc.arizona.edu/>