

SYLLABUS
Astronomy 170B1, Section 003
The Physical Universe
Fall 2021

LECTURES: Monday/Wednesday: 2:00 – 3:15 p.m. (**No Class on Sep 6**)
Flandrau Science Center, EOS Planetarium Theater

INSTRUCTOR: Dr. Thomas A. Fleming
Steward Observatory Room 209
(520) 621-5049
taf@arizona.edu

OFFICE HOURS: Mon 10:30am – 11:30am; Thu 10:30am – 12:00pm

TEACHING ASSISTANT: Jane Bright
Steward Observatory Room 214
(520) 621-4934
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OFFICE HOURS: Tue 1:00pm – 2:00pm; Wed 10:00am – 11:00am

MIDTERM EXAMS: Wednesday, September 29, 2:00 p.m.
Wednesday, November 3, 2:00 p.m.

FINAL EXAM: Friday, December 10, 1:00 – 3:00 p.m.

REQUIRED TEXTBOOK: *Starry Night College Textbook*

REQUIRED EQUIPMENT: TurningPoint® ResponseCard NXT, QT or QT2 (a.k.a. “clicker”)

WEBSITES: <http://D2L.arizona.edu> <https://learn.simcur.com>

PARTICIPATION IN CLASS: Participation will be measured electronically at each lecture and will figure into your final grade. You are required to purchase an NXT or QT Response Card (clicker) for this course. You are responsible to bring it to *every* class period, *including* exams. In order to encourage you to do so, we will give you participation points for using your clicker in class. **Students without a clicker will not receive participation points.** You will receive points if you have an official excuse from the Dean of Students Office, a note from a health care provider, or you are observing a religious holiday which is associated with an organized religion to which you belong. You are responsible for informing Dr. Fleming or Ms. Bright if this is the case. Students are responsible for all information given out in the lecture, including schedule changes. We will engage in many interactive learning exercises using your clicker in class (some for credit); this will improve your understanding of the material and lead to a better grade. So be smart, attend class!

REQUIRED TEXT & SOFTWARE: You are required to purchase *Starry Night College Textbook*. You can purchase it for \$29.95. You automatically have access to the course materials FREE through September 5, 2019. **The deadline to opt-out for a 15-week course beginning August 23rd is 9:00pm MST, September 5, 2019. If you officially withdraw from this course, you will automatically be “opted-out.”** If you do not opt-out and choose to retain your access, the cost of the digital course materials (\$29.95) will appear on your October Bursars account. Please refer to the Inclusive Access FAQs at this URL for additional information:

<https://shop.arizona.edu/textbooks/Inclusive.asp>

You are responsible for the material in the textbook, whether covered in class or not, unless otherwise noted. Later in this syllabus, we tell you which chapters correspond to the lectures given each week. You are required to read those chapters before coming to class that week.

HOW TO SIGN INTO STARRY NIGHT COLLEGE TEXTBOOK:

Chrome is the preferred web-browser for accessing *Starry Night College Textbook (SNCT)*.

- Go to <https://learn.simcur.com>
- Click the **Sign In** button. Sign in using your @email.arizona.edu email address. Ask your instructor if you are not sure. Press **Continue**.
- You will be taken to the Canvas login screen. Enter your @email.arizona.edu email and the 8 character password provided by your instructor. (You will find your 8-character password on the Grades page of our D2L course site.)
- A new window will load requesting access to your account. Press **Authorize Access**.
- You will then be automatically signed into the SNCT platform.
- Click the **Redeem a Product Code** button and enter the following redeem code (case-sensitive) to unlock the textbook: qm7CQH5
- Click on the **Assignments** tab at the top to view a list of your assignments and their due dates.

ALL EXAMS are closed book and closed note. All phones & pagers must be packed away and hidden from view!
If you are seen with a phone/WiFi-enabled device in your hand during an exam, you will fail the exam!

GRADES: Your final grade for the course will be based on the midterm and final exams and other assignments in the following proportion:

Midterm Exam #1	100 points (12.5%)
Midterm Exam #2	100 points (12.5%)
Final Exam	100 points (12.5%)
SNCT Assignments	350 points (43.8%)
Writing Assignments	100 points (12.5%)
Participation	50 points (6.2%)

All questions, disputes, or mistakes regarding the grading of exams and assignments must be brought to Dr. Fleming's attention within 1 week after the score for exam or assignment is posted.

These are the hardest percentages needed to earn a specific grade. We reserve the right to curve the class further, making the grading slightly easier. Under no circumstances will anyone doing less than 50% work pass this class.

A = 720 points (90%)
B = 640 points (80%)
C = 520 points (65%)
D = 400 points (50%)
E < 400 points

ACTIVITIES/HOMEWORK: We will assign homework on a regular basis from *Starry Night College Textbook*. Homework problems will involve using the *Starry Night* software. You may discuss the astronomy concepts with your classmates, but you are expected to do your own work on these assignments. Late homework will **not** be accepted.

WRITING ASSIGNMENTS: Throughout the semester, you will be required to write essays and/or reports based on news stories involving astronomy and space science. You will receive feedback on one of these writing assignments with an opportunity to rewrite and resubmit it for an improved grade.

NO smoking, eating, drinking (except water), or pets are allowed in class. Please **turn off** your cell phones!

LEARNING OUTCOMES: ASTR 170B1 is a Natural Sciences Tier 1 course in the University of Arizona General Education program. Upon completion of this course, students will be able to:

- understand the nature and application of physical science
- apply ideas and processes beyond the classroom
- recognize the complexity of many scientific issues
- speak and write about scientific knowledge
- appreciate the relative scale of objects, rates of change, linear and nonlinear growth
- critically analyze and interpret data and results presented in tables, graphs and charts as well as perform appropriate mathematical calculations
- read and understand scientific literature from popular sources such as magazines and newspapers

LEARNING GOALS FOR THIS COURSE: You will be expected to take an active role in your learning. Do not expect us to lecture for the entire class period while you sit, listen, and take notes. Class time will be peppered with “mini-lectures,” separated by various activities which will make use of the clickers and the full-dome planetarium environment. Be prepared to interact with your classmates, ask questions, and participate in group discussions. You will also interact with computer-generated animations and exercises.

Here are the learning goals for this course:

- 1) You will have an appreciation for what science is and is not.
- 2) You will be familiar with basic astronomical terminology and some of the results of astronomical research.
- 3) You will have a sense of the scale of the Universe and our place in it.
- 4) You will have exercised your critical thinking and problem-solving skills.

We ask that you participate fully in the course. In return, we promise to make this course interesting and **fun**.

DEADLINES: You will be given at least one week to complete an assignment. If you choose to wait until a few hours before the deadline to do your assignment, you are taking a calculated risk. Should your printer break, Internet go down, or an emergency arise at the last minute, these will not be valid excuses. However, you will be given extra time IF you miss a deadline because of circumstances related to the COVID-19 pandemic. You will not get an extension if you merely chose to wait until the last moment to start the assignment. If this worries you, start your assignments early and hand them in early!! You can submit an assignment any time before the deadline.

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. All students must be prepared to present valid picture identification if requested during an exam period. Any incidents of academic dishonesty will be dealt with according to the University of Arizona's Code of Academic Integrity. This Code can be viewed at the Dean of Students website:

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

The consequences can range from loss of credit on an assignment to dismissal from the University, depending on the severity of the offense. In our class, the penalty for plagiarism, cheating on an exam, or clicker/computer fraud will be automatic failure of the course and, depending on the circumstances, I may seek your suspension or expulsion from the University.

You should also be aware of the University's policies on disruptive and threatening behavior:

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

TURNITIN.COM: If you decide to take and continue in this course, you are agreeing to submit your essays online to a plagiarism-prevention program called TurnItIn.com. You should note that TurnItIn.com – always without your name and any personal information – will retain your paper as part of their database so that students who plagiarize from it can be detected. Because of this program, the vast majority of you who do your own work and cite your sources of information properly will not have to compete with students who commit undetected plagiarism. Anyone who has questions or problems with TurnItIn.com may talk privately about these with Dr. Fleming.

STUDENTS WITH DISABILITIES: If you anticipate issues related to the format or requirements of this course, please meet with Dr. Fleming. I would like us to discuss ways to ensure your full participation in the course. If you determine that formal, disability-related accommodations are necessary, it is very important that you be registered with Disability Resources (621-3268; <http://drc.arizona.edu>) and notify us of your eligibility for reasonable accommodations. We can then plan how best to coordinate your accommodations. **Dr. Fleming does not use the DRC testing center**; all testing accommodations will be administered at the Flandrau Science Center.

QUESTIONS: You are encouraged to ask questions in class and to seek help if needed. It is to your advantage to seek help when you encounter problems rather than at the last minute before a deadline. I am here to help you understand something about science and the subject of astronomy. Remember, there are no stupid questions!

TOPIC SCHEDULE & READING ASSIGNMENTS:

<u>Week</u>	<u>Topic</u>	<u>Chapters in the <i>SNCT</i></u>
Aug 23/25	Scale of the Universe, Celestial Motions	1, 2.1, 4
Aug 30/Sep 1	History of Astronomy	2.2 – 2.4
Sep 8	Motion & Gravity	3
Sep 13/15	Light, Matter, Solar System	5, 7.1, 7.2
Sep 20/22	Formation of Planets, Terrestrial Planets	7.4, 9, 10
Sep 27	Jovian Planets	11
Oct 4/6	Dwarf Planets, Asteroids, Comets	12, 13
Oct 11/13	The Sun	15, 16
Oct 18/20	Stars, The H-R Diagram	17, 18
Oct 25/27	ISM, Nebulae, Stellar Evolution	20, 22, 23
Nov 1	Relativity, Black Holes	24
Nov 8/10	The Milky Way Galaxy	25
Nov 15/17	Galaxies & their Properties	26
Nov 22/24	Quasars, Galaxy Evolution	27
Nov 29/Dec 1	Cosmology, The Big Bang	28, 29
Dec 6/8	Extraterrestrial Life, Exoplanets	30, 21

THEATER ETIQUETTE IN THE AGE OF COVID-19:

Due to the ongoing COVID-19 pandemic, we must all agree to follow certain protocols in order to conduct our class in-person in a safe and responsible environment. The University of Arizona has already instituted protocols, which will probably change throughout the semester. You will find the current protocols under which we will operate at:

<http://covid19.arizona.edu>

In addition, there are a few protocols that are particular to the Flandrau Science Center. We ask you to observe the following protocols to ensure a safe classroom experience in the Flandrau Science Center Planetarium Theater:

- If you are feeling ill or in any type of quarantine due to the University's COVID -19 protocols on the day of class, please do NOT come to class. The class presentation will be recorded for you to watch on-line.
- There is another class that meets in the Planetarium Theater before our class. Please do not arrive for class before 1:45 p.m. If you must wait outside, please remember to social distance.
- There is a sanitizing station located at the entrance to the Planetarium Theater. Please sanitize your hands when you enter the theater and when you exit the theater. Like President Robbins likes to say: "GEL in...GEL out!"
- There is no eating allowed in the Planetarium Theater. You may not bring food or drink, other than water, into the theater. (You may briefly drop your mask to drink water.)
- Please make every effort to arrive in class on time and not leave until class is over. If you must arrive late or leave early, please do not disrupt class or distract your classmates.
- **For safety reasons, when the FULLDOME PROJECTOR is in use, the doors to the planetarium theater will be LOCKED. You will not be able to enter the theater/class while the projector is in use; you must wait until the presentation is over and the doors unlock before entering the classroom.**

Finally, you will *never* be penalized in any way in this course for being in COVID-19 quarantine or for following standard public health practices.

HONORS CREDIT: This course is available for Honors credit via an Honors contract. To receive Honors credit, you will have to conduct a project that is more challenging than the assignments outlined in this syllabus, such as taking astronomical images with a telescope. More info at:

<http://www.honors.arizona.edu/future-students/honors-credit-across-campus>