

# **ASTR 170B1: The Physical Universe**

Fall 2018 – Section 002

MWF 10-10:50 am

Dr. Don McCarthy

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## I. Contact and User Information

**Professor** Dr. Don McCarthy  
Email: [dmccarthy@as.arizona.edu](mailto:dmccarthy@as.arizona.edu)  
Twitter: @stellarDon  
Office: Steward Observatory, room N404. Ride the main elevator up to the fourth floor and look straight ahead.  
Office hours: Tuesday 3-5 pm; Wed. 2-4 pm (Bookstore 2<sup>nd</sup>-floor conference room) and by appointment  
Availability: **any** time. Please (!) do not hesitate to contact me.

**Graduate Teaching Assistant** Ms. Carolyn Raithe

Email: [craithel@email.arizona.edu](mailto:craithel@email.arizona.edu)  
Office: Steward Observatory, room N317. Ride the main elevator up to the third floor, turn right twice, then left, and look down the hall on the left side.  
Office hours: to be determined  
Availability: to be determined

## Links, Settings, Times

For reminders via texts: Send @astr17 to 81010 or to (520) 441-3714  
Class Web site: <http://lavinia.as.arizona.edu/~dmccarthy/ASTR170B1/index.html>  
Free online textbook: <https://openstax.org/details/astronomy>  
Lecture recordings: available on our [D2L](#) site under the “Content” tab  
Study session: Wednesdays from 2-4 pm (Bookstore 2<sup>nd</sup>-floor conference room)  
Think Tank: to be determined  
Nighttime observing: on announced Thursdays from sunset to ~8:30 pm

## II. Course Overview

ASTR 170B1 is a three-credit, general education course at the Tier I level intended for students with no university-level background in science and mathematics. Our course focuses on understanding (not memorizing) the physical processes at work in the Universe and on building an awareness of how science influences daily life. We will also use the subject of astronomy to improve skills in communication (written and oral), in numbers, and in problem solving. The expected Learning Outcomes are summarized here: <http://gened.arizona.edu/content/tier-one-outcomes#Nats>.

Location: MWF from 10-10:50 am in the auditorium (N210) of Steward Observatory. Lectures will begin promptly at 10 am. If you arrive late, please enter quietly from any of the three entrances but feel free to come up front for a good seat. Food and drinks are not allowed.

Web sites: The site listed above is the focal point for the course. All course materials are posted there and available for downloading. Our class has a presence on the University’s D2L site but only for accessing lecture recordings (via the Content tab).

Students are expected to ...:

1. Attend every class and participate in questions and activities;
2. Come to class prepared to contribute by completing the required daily assignments;
3. Always write clearly using good English grammar;
4. Be attentive at all times and avoid using any electronics during class.

Foreign Students: This course aims to help you to improve proficiency in English writing and speech. You are strongly encouraged to work with American students and the leaders of this course, both during and outside of, class. Also, the Center for English as a Second Language ([CESL](#)) provides

opportunities, both day and night, to help you improve your writing skills, oral communication, and grammar. They also offer tutoring opportunities.

### III. Online textbook

The textbook for this class is available for free online, in Web view and PDF format from <https://openstax.org/details/astronomy>. You can also purchase a print version, if you prefer, via [OpenStax](#) on [Amazon.com](#). The Web view is recommended, and the responsive design works seamlessly on any device. If you buy via Amazon, make sure you use the following link so you get the official OpenStax print version. (Simple printouts sold by third parties on Amazon are not verifiable and not as high-quality.)

Astronomy from OpenStax, ISBN 1938168283, <http://www.openstax.org/details/astronomy>

### IV. Simple Guidelines to Earn Your “A”

To be most successful, each student should set a personal goal of achievement and

1. Read directions carefully.
2. Think about material instead of just memorizing it.
3. Attend every class.
4. Start homework early by reading each assignment as soon as it is posted. Your mind will then be prepared to pickup on hints and examples presented in class.
5. Apply each of the *Daily Skills* (numerical and communication) as they accumulate.
6. Proofread your work carefully to avoid careless errors.
7. Ask questions!
8. Seek help whenever needed by asking questions in class, attending office hours and study sessions, or by making an appointment.

### V. Requirements

#### Academic Integrity

Dr. McCarthy and the Department of Astronomy adhere to the University's Code of Academic Integrity as described in Section VIII. Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, graded work/exercises must be the product of independent effort unless otherwise instructed. Such violations of the Code can be penalized by expulsion from the University and negative reports in your official records. **If you are having difficulty in this course, PLEASE just ask for help instead of sacrificing your future.** <http://deanofstudents.arizona.edu/academicintegrity>

The University Libraries have some excellent tips for avoiding plagiarism, available at <http://www.library.arizona.edu/help/tutorials/plagiarism/index.html>.

Teamwork Policy: You may **start** an assignment in a team. However, once you decide HOW to approach a problem, **you must then make all your own measurements and use your own wording** to interpret and express conclusions. Any assignments that appear identical will be awarded "zero" points and can lead to expulsion from the class and the University. At a minimum, such violations of the Code will lead to an Academic Integrity investigation with the Dean of Students Office.

#### Your Personal Star Name

On the first day of class you will be assigned a star name as your code name for all assignments, exams, projects, and for posting of grades. Your star name will be located on the upper-right corner of the Acknowledgement of Syllabus form. **To protect your privacy, never write your personal name or student ID number on any assignments in this course. Use your star name instead.**

### Daily Skills

Students are expected to write clear sentences and paragraphs using good English grammar for all assignments and exams. Each class period is associated with a suggested basic “*Daily Skill*” in communication and numerical thinking. You should read these skills and put them into practice throughout our course. Both sets of *Daily Skills* are located in the Content section of our Web site.

Daily Homework assignments are a major required component (25%) of this course and will emphasize skills in numeracy and writing. Typically, the daily homework will prepare you to understand the next day’s lecture material and to collaborate with other students on related activities during class. The following **rules** apply to all homework assignments:

1. You must adhere to each of the “*Daily Skills*” (numerical and communication) as they accumulate each day of our course.
2. Electronic submissions are not accepted.
3. All homework must be typewritten and stapled. Math symbols and calculations may be handwritten but must be legible.
4. Homework is due at the start of class on the specified date. If an assignment is turned in late, a **late-penalty** of 15% will be assessed for each class period that has elapsed since the due date. Assignments will not be accepted after two subsequent classes.
5. You must always **SHOW** or explain **HOW** you reached a solution by recording intermediate steps in a calculation or describing your solution logically in words. Simply listing an answer is not acceptable and will not receive any points.
6. Some assignments require your opinion to be clearly stated, so your grade will be determined more by your reasoning and writing abilities than by the exact answer.
7. Teamwork Policy: You may **START** an assignment in a team. However, after deciding **HOW** to approach a problem, **you must then make all your own measurements, graphs, and tables and always use your own wording to interpret and express conclusions.** Homework solutions that appear identical are a violation of the Code of Academic Integrity and will receive a grade of zero plus potential expulsion from the course.

Major Essay: Through a series of seven interactive assignments spread throughout the course, each student will write a final essay of ~8-10 pages about the probability of alien intelligent life in our galaxy, combining both facts and personal opinion. At least three of those assignments will generate written feedback from the teaching staff about content and writing style. You are expected to incorporate these suggestions in the next version in order to demonstrate overall improvement in writing proficiency. This essay will be worth 20% of the course grade. It will be graded according to the rubric used in the Writing Program of the Dept. of English: Content (45%), Organization (15%), Expression (15%), Mechanics (10%), along with demonstrated improvement during each of the prior six submissions (15%).

Daily Responses and Feedback will be graded and count towards your attendance grade. Your written responses will promote and assess understanding, self-assessment, attention, participation, and teamwork. Quizzes will consist of several questions spread throughout each class.

### Exams

There will be two in-class exams (Sep. 21; Oct. 19, and a final exam (Dec. 7, 10:30 am to 12:30 pm). The two-hour final exam will emphasize the final third of the course. The last two exams will provide “*Resurrection Points*” for students to earn back points lost in previous exams. There will be **NO** makeup exams except in cases of extreme difficulty such as a proven illness.

All exams will feature a scratch-test format that allows you to continue answering a question until you answer correctly. The number of points awarded decreases with each attempt. Typically, this format improves your grade by 10%, i.e., a full letter-grade. Most questions will be multiple-choice but each exam will include at least one short-answer essay question.

ALL exams will be CLOSED-BOOK and CLOSED-NOTES. You may bring a handwritten, double-sided page of notes (“crib sheet”) to each exam. Exams will emphasize understanding instead of memorization. Bring your UofA CAT Card, a #2 pencil, and a “scratcher” (penny, paper clip, etc.).

Here are links to the University’s Final Exam Regulations and Schedule:

<https://www.registrar.arizona.edu/courses/final-examination-regulations-and-information>

<http://www.registrar.arizona.edu/schedules/finals.htm>

## **VI. Getting Help**

Office Hours: Tuesday (3-5 pm) and by appointment. Feel free to suggest other times!

Study Session: Dr. McCarthy will lead an optional homework study session each Wednesday afternoon from 2-4 pm in the University’s SUMC Bookstore, 2<sup>nd</sup>-floor conference room by the Health and Beauty area near Starbucks. Students are welcome to attend and work with each other and with the instructors. To receive help from the instructors on any problem, you must already have attempted that problem. Students will be asked to help each other and to lead discussion.

Tutoring: The “Think Tank” offers tutoring for astronomy. Location and time will be announced.

Preceptors are highly motivated students who wish to help teach their peers under the supervision of the course instructor. Often students learn best from other students and preceptors can really "make a difference." As a preceptor in this course you would take an active role in the teaching process by working directly with Dr. McCarthy. You would also receive University credit by enrolling in LASC 197a (<http://teachingteams.arizona.edu/?q=preceptor/howto>) and completing several workshop sessions with other University preceptors to learn and practice skills in effective teaching. If you would like to become a preceptor, please contact Dr. McCarthy and also learn about the Teaching Teams Program (<http://teachingteams.arizona.edu/>).

Lecture Recordings of each lecture can be accessed from our [D2L](#) site under the Content tab. These recordings consist of audio plus video of the main screen but not of any demonstrations.

Preparing for Exams: Interactive review sessions will be held one or more days ahead of each exam to provide an opportunity to ask questions and to practice concepts presented during the course. A study guide and sample questions will be posted to help you prepare for exams.

## **VII. Grading**

Course Grade: Students have two options for calculating their semester grade if you consult with Dr. McCarthy by September 24. Grades will be derived from the following categories with the indicated percentage weights.

### OPTION #1 (Default):

Daily homework (25%)

Essay on the probability of alien life in our galaxy (20%)

In-class work: Written responses, quizzes, collaborative activities, etc. (15%)

Participation (see below): (10%)

Three exams, including the final exam (10% each)

OPTION #2 (Negotiable by September 24):

You may negotiate with Dr. McCarthy the percentages of homework and exams.

“Participation” includes attending class regularly, completing assignments, quizzes, asking relevant questions during class, seeking help during study/review sessions and office hours, helping to lead discussions, etc.

Final course grades will be assigned as follows: A (90-100%); B (80-89%); C (70-79%); D (60-69%); E (<60%). Borderline grades, such as B+ ( $\geq 87\%$ ), will be rounded to the next letter grade only if the student completed extra-credit work as discussed below.

“TBD” Grades: Sometimes students misread a question, or get started in the wrong direction, or make a simple mistake that leads to the wrong conclusion. Such assignments will receive a “TBD” grade (i.e., to be determined), allowing you to get back on track to earn a 100% score if you meet with the course’s teaching staff within one week to discuss your work and arrange to improve it.

“*Resurrection Points*.” We encourage long-term learning throughout the semester. Even if you perform poorly on Exam #1 or #2, you can “resurrect” points lost by demonstrating correct understanding of the same concepts on the next exam(s). Therefore, you can earn a 100% grade on the exam component of this course until the very last moment of the semester.

Extra-credit: Excellent work on two extra-credit activities can increment your semester grade by as much as one-half a letter grade. For example, a B+ (87-89%) will become an A; however, <87% will still be registered as B. No extra-credit activities will be accepted after December 7. A maximum of two extra-credit activities is allowed, but you are welcome to undertake more! Extra-credit may be obtained by participating in activities such as public lectures, observing projects, field trips, etc. A description of such opportunities is posted on the left-hand side of our class Web site.

Honors Credit: Students wishing to contract this course for Honors Credit should email Dr. McCarthy to set up an appointment to discuss the terms of the contact. Information on Honors Contracts can be found at <https://www.honors.arizona.edu/honors-contracts>.

Incomplete (I) or Withdrawal (W) Grades: Requests must be made in accordance with University policies, which are available as follows:

<http://catalog.arizona.edu/policy/grades-and-grading-system#incomplete>

<http://catalog.arizona.edu/policy/grades-and-grading-system#Withdrawal>

## **VIII. Course Policies**

### Academic Integrity

Dr. McCarthy and the Department of Astronomy adhere to the University's Code of Academic Integrity. The Dean of Students' Web site below describes the Code and resources that are available to you for improving your work. Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, graded work/exercises must be the product of independent effort unless otherwise instructed. Such violations of the Code can be penalized by expulsion from the University and negative reports in your official records. **If you are having difficulty in this course, PLEASE just ask for help instead of sacrificing your future.**

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

The University Libraries have some excellent tips for avoiding plagiarism, available at <http://www.library.arizona.edu/help/tutorials/plagiarism/index.html>.

Selling class notes and/or other course materials to other students or to a third party for resale is not permitted without the instructor's express written consent. Violations to this and other course rules are subject to the Code of Academic Integrity and may result in course sanctions. Additionally, students who use D2L or UA e-mail to sell or buy these copyrighted materials are subject to Code of Conduct Violations for misuse of student e-mail addresses. This conduct may also constitute copyright infringement.

Teamwork Policy: You may **start** an assignment in a team. However, once you decide HOW to approach a problem, **you must then make all your own measurements and use your own wording** to interpret and express conclusions. Any assignments that appear identical will be awarded "zero" points and can lead to expulsion from the class and the University. At a minimum, such violations of the Code will lead to an Academic Integrity investigation with the Dean of Students Office.

Attendance and Absences:

Participating in the course and attending lectures and other course events are vital to the learning process. As such, attendance is required at all lectures and discussion section meetings. Students who miss class due to illness or emergency are required to bring documentation from their health-care provider or other relevant, professional third parties. Failure to submit third-party documentation will result in unexcused absences.

You are required to attend each class in accordance with University policy:

<http://catalog.arizona.edu/policy/class-attendance-participation-and-administrative-drop>

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:

<https://deanofstudents.arizona.edu/absences>

Holidays: All holidays observed by organized religions will be honored for those students who show affiliation with that particular religion. All absences pre-approved by the Dean of Students will also be accepted. <http://www.registrar.arizona.edu/calendar-religious-holidays>

Behavior: To foster a positive learning environment, students and instructors have a shared responsibility. We want a safe, welcoming, and inclusive environment where all of us feel comfortable with each other and where we can challenge ourselves to succeed. To that end, our focus is on the tasks at hand and not on extraneous activities (e.g., texting, chatting, reading a newspaper, making phone calls, web surfing, etc.).

Dr. McCarthy promises to be respectful of all students. He expects you will do the same as stated in the Student Code of Conduct and other University guidelines concerning disruptive and threatening behavior.

<https://deanofstudents.arizona.edu/student-code-conduct-student-faqs>

<http://policy.arizona.edu/education-and-student-affairs/disruptive-behavior-instructional-setting>

The University's Threatening Behavior by Students Policy prohibits threats of physical harm to any member of the University community, including to oneself.

<http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students>

Special Accommodations: Our goal in this classroom is that learning experiences be as accessible as possible. If you anticipate, or experience, barriers related to the format or requirements of this course, please meet with Dr. McCarthy so that we can discuss ways to ensure your full participation in the course. If you determine that disability-related accommodations are necessary, please register with Disability Resources (520-621-3268; <https://drc.arizona.edu/>) and notify me of your eligibility for reasonable accommodations. We can then plan how best to coordinate your accommodations.

Nondiscrimination and Anti-harrassment:

Dr. McCarthy is committed to creating and maintaining an environment free of discrimination as described in the University's policy at the link posted below. Our classroom is a place where everyone is encouraged to express well-formed opinions and their reasons for those opinions. He also wants to create a tolerant and open environment where such opinions can be expressed without resorting to bullying or discrimination of others.

<http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy>

**IX. Subject to Change Statement**

Required language: 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.