

Astronomy 380: Life in the Universe

Instructor:

Professor: Cole Miller, CSS 1239, (301) 405-1037, miller at astro.umd.edu

Office hours: Tuesday and Thursday, 11 AM to noon or by appointment.

Grader: Dheeraj Pashem, CSS 0228, (301) 405-1566, dheeraj at astro.umd.edu

Office hours: by appointment only.

Class web page: <http://www.astro.umd.edu/~miller/teaching/astr380f09>

I will post written lecture notes before each class, and assume you have read them before the actual lecture. Within a few days after a given class I will then post PDF versions of my PowerPoint slides.

Schedule:

Lectures on Tuesdays and Thursdays from 9:30 to 10:45, CSS 2400.

Textbooks:

Required: *Life in the Universe* by Bennett and Shostak.

Academic Integrity

Feel free to discuss homework with other students, but you must work out and write up the solutions yourself. I am looking for answers in your unique words and not those of a fellow student, our textbook or other books, the Web, or any other source. If, in a rare case, you feel that a short quote is essential to your answer, put it in quote marks and cite your source. For example, "As Carl Sagan said: 'billions and billions' (source: Cosmos)". Copying of words in bulk without attribution (even with small wording changes) or copying of another student's work risks being sent up for a possible violation of academic integrity. See <http://www.studenthonorcouncil.umd.edu/code.html> if you have any questions about academic integrity. Copying of large parts of a source *with* attribution is not a violation of academic integrity but it will result in a lower grade on the assignment; I want to know your thoughts, not those of some other source! Your best bet in all this is to do whatever research you need, but write up your answers without looking at any sources. Then, you can go back to see if you accidentally copied more than you realized.

Course Grading

Homework	25%
Midterm Exam	30%
Final Exam	40%
Class Participation	5%

Each problem in the homework and in the exams will be graded on a four-point scale. The midterm and final will both be in-class, and we can negotiate whether they are open-book or closed-book. The final exam will be cumulative.

Homework will be assigned approximately every two weeks, on Thursdays. The homework will be due at the beginning of class two Thursdays later, and the solutions and graded homework will be returned to you by the following Tuesday. The reason I want you to turn in your homework at the beginning of class is so that you can absorb the content of

that lecture instead of worrying about the problems! I will therefore enforce this policy strictly, and will take off points for homework turned in after class begins (i.e., after I start speaking). I will require that you turn your homework in typed or printed out from a computer, except for derivations, which you can do by hand. This will save wear and tear on our grader :).

Class participation will be determined by your interaction during classes; I will ask many questions during class, and although I don't expect you to get the "right" answer every time I do want you to try.

Letter Grades

I will guarantee that you will receive no worse than the following letter grades for a given percentage of the total available points (note: there will be no extra credit):

90%–100%	A
80%–90%	B
70%–80%	C
60%–70%	D

I may grade on a curve if the average is significantly lower than suggested by the table.

Late Policy and Make-Up Policy

Partial credit for late homework assignments may be given if you give me a valid reason, with written documentation, by the Tuesday before the assignment is due. No credit will be given for homework turned in after the beginning of the following class on Tuesday, because solutions and graded homeworks will be handed out then. If you cannot make the midterm or the final exam, then we can arrange a different time if you tell me at least a week before the exam (to be fair to other students, the alternate time should be before the scheduled time).

Laptop Policy

In principle, laptops can allow you to take notes faster and access the class website. In practice, they are more likely to be used for non-class purposes :). Therefore, what I will require is that if you use a laptop (1) you sit in the far back row, so that there are no students behind you to be distracted, and (2) you turn the sound off and do not use headphones. This will minimize the potentially negative impact. If despite these approaches the use of laptops turns out to be too distracting for the class as a whole, I may need to ban them entirely, but let's hope that doesn't happen.

As a final comment, the university would appreciate it if you filled out evaluation forms when they are up (between December 1 and 13) at www.courseevalum.umd.edu. Thanks!

Tentative Course Outline

Sep 1–3: Overview and the scale of the universe **Reading: Ch 3**

Sep 8–10: Cosmological origins **Reading: Ch 3**

Sep 15: Planet formation **Reading: Ch 4**

Sep 17: Homework #1 due

Sep 17–29: Biological evolution **Reading: Ch 5, 6**

Oct 1: Homework #2 due

Oct 1: The origin of life **Reading: Ch 5, 6**

Oct 6: The limits of life: extremophiles **Reading: Ch 5, 6**

Oct 8: Mass extinctions **Reading: Ch 5, 6**

Oct 13: Midterm

Oct 15–20: Possible requirements for life **Reading: Ch 10**

Oct 22: Homework #3 due

Oct 22–Nov 3: Possibilities for life in the Solar System **Reading: Ch 7, 8, 9**

Nov 5: Homework #4 due

Nov 5: Extrasolar planets **Reading: Ch 11**

Nov 10: The future of life on Earth **Reading: Ch 10**

Nov 12: The Drake equation **Reading: Ch 12**

Nov 17–24: Intelligent life in the universe **Reading: Ch 12**

Nov 19: Homework #5 due

Nov 26: No class: Thanksgiving

Dec 1–8: Interstellar travel and the Fermi paradox **Reading: Ch 13**

Dec 10: Future missions, current research, and terraforming

Dec 15: Final exam: CSS 2400, 8-10 AM