

ASTRONOMY 200LG - SUMMER 2020 (ONLINE INSTRUCTION)

***** Please make sure to see me ASAP if you were not present on the first day of class or enrolled late for the course*****

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Office hours: Mondays, Tuesdays, and Wednesdays, 2:00pm– 3:00pm, and by appointment

Office Hours Zoom Meeting Room: <https://usc.zoom.us/j/9724034151>

Welcome to Astronomy 200: Life in the Universe! One of the oldest and most intriguing questions posed by humankind is “are we alone?” In the Twenty-First century, this question has gained new meaning and impetus as we find scores and scores of planets orbiting other stars, and begin in earnest to search for life not just in our solar system, but in our galaxy and in the vastness of the Universe. As a first step, we will explore how the Universe came to exist, how our solar system formed, and our place in the Universe. We will go beyond this, however, as we define life (as we know it), explore the necessary ingredients for the existence and persistence of life, and the evolution of life on Earth. Finally, we’ll examine the solar system and nearby stars for the possibility of the existence of life.

This course is designed specifically for those non-science majors who have very little, if any, background in the sciences and mathematics. The course is non-mathematical by prerequisite, but you will have to learn to do some calculations. However, these calculations will be very simple and will employ formulae that are easy to remember. You will have the opportunity to note that formulae represent ideas. Mathematics is the language of science.

1. TEXTBOOK AND OTHER RESOURCES

Textbook

Bennett & Shostak, *Life in the Universe*, 4th edition, Pearson, 2016.

Since we will be using Mastering Astronomy for the homework assignments in this course, you have the option of purchasing the textbook (bound or loose leaf) from the USC Bookstore or purchasing an eBook with Mastering Astronomy access online (<https://www.pearsonmylabandmastering.com/northamerica/>) for \$60. Please note that if you have purchased or have access to a used textbook, you will still need to purchase a Mastering Astronomy access code.

Astronomy on the Internet

There is a vast amount of information (and lots of pretty pictures) on the internet. I’ve listed some of these sites on a separate list published on Blackboard. You can also find many more sites by simply Googling the specific topic you’re looking for. Also, Wikipedia is considered a (mostly) reliable source for astronomy, so don’t shy away from using Wikipedia in your web searches.

2. GUIDELINES.

2.1 Registration and administration

Your registration for this course consists of two separate parts: the lectures and the laboratory. You must register for each of them.

The Undergraduate Physics Office in ACB 439 deals with all administrative aspects of this class. Additional help regarding administrative issues is available from Kimberly Burger in ACB 439 with phone number (213) 740-7728 and email address burgerk@usc.edu.

2.2 Disabilities

Students who need to request accommodation based on disability are required to register each semester with the Office of Disability Services and Programs (DSP). This office can be found at STU 301 with phone number 231-740-0776. A letter of verification to the instructor from the DSP is needed for the semester you are enrolled in. If you have any further questions please contact the DSP or the instructor.

2.3 Grading

Your grade will be determined according to the following key:

80% lectures:

10% Homework

40% Midterms (best two out of three, 20% each)

30% Final exam

20% laboratory

Broadly speaking, grading is done by the distribution curve of the combined scores of exams, homeworks and lab. No rigid percentage marks (such as, e.g., a rule that 90% corresponds to an A–, or similar) are used. Further details about the grading procedure are given in class. **You cannot pass the course if you do not earn a passing grade (14/20 or 70%) on the lab portion of the course.**

Students taking the course Pass / No Pass must reach a minimum overall score of 70% to pass the course, regardless of the manner in which letter grades are assigned to students taking the class for a letter grade.

2.4 Exams

There will be three 50-minute midterm exams and one 100-minute final exam. The midterms will be given during the lecture that they are scheduled in. Of the three midterms, only the scores of the two highest will be counted, and the score of the lowest of the three will be dropped. The midterms will cover the course material incrementally throughout the semester, and the final exam will cover the whole course. **All exams will be administered via Blackboard and are open book and open notes.**

Please note that the third midterm exam can serve as a make-up exam for either of the first two exams. There will not be any other make-up exams. Any student missing two of the three midterms will only have recorded the points scored on the one exam taken. Please inform me ASAP if you intend to miss the first or second midterm exams.

2.5 Homework

We will be using the Mastering Astronomy online homework system for this course. To access the assignments for this course, please go to <https://www.pearsonmylabandmastering.com/northamerica/masteringastronomy/>, then click on the “Student” button under the “Register Now” heading on the right side of the page. You will need to enter the course ID **PEROOMIANASTRO200S20**.

Homework assignments will be due every week, at midnight on Thursdays. Homework can be turned in up to 24 hours late for 50% credit. You can set up reminders for assignments that are due through Mastering Astronomy. Please note that exceptions will not be made to homework deadlines.

I expect that it will take a couple of hours to complete each of your homework sets. The homework sets are the central means by which to master the course material, and, consequently, to perform well in the exams

Homework will count for 10% of your total score. Each of the 5 assignments listed below will be worth 100 points, and a cumulative score of 400 out of the maximum 500 points will equate to a 100% homework grade (this is equivalent to, but better than, dropping one homework as you can use all 5 assignments to reach the 400 points).

Homework Schedule

Homework #1

Due: Thursday, July 9, 2020

Homework #2

Due: Thursday, July 16, 2020

Homework #3	Due: Thursday, July 23, 2020
Homework #4	Due: Thursday, July 30, 2020
Homework #5	Due: Thursday, August 6, 2020

2.6 Laboratory

The course Astronomy 200 has a **mandatory** laboratory component, and you should already be signed up for one of the laboratory sessions. The purpose of the laboratory is to give you some feeling for making and interpreting observations, thereby reinforcing some of the course material by direct experience. Indeed, without such experience, some of the theoretical material could appear a little too abstract. Another purpose is that you can get some hands-on experience in using a telescope: Often one can see spectacular pictures taken from large telescopes around the world or from the Hubble Space Telescope (HST) and you might be curious about what is possible from a small, but good “amateur” telescope.

Note that late registration in the course will NOT excuse you from any labs you’ve missed, and you must contact the Lab Director, Joseph Vandiver (SGM 309; Phone: (213) 740-8889; Email: vandiver@usc.edu) IMMEDIATELY if you’ve signed up late for the course.

I hope that our laboratory will enhance your experience and enjoyment of this course. Please appreciate the great logistical complexity of arranging laboratories for so many people with such a broad variety of backgrounds: I therefore kindly request your good will and patience in this enterprise.

Questions concerning the laboratory should be referred to the Lab Director, Joseph Vandiver (SGM 309; Phone: (213) 740-8889; Email: vandiver@usc.edu).

All of the labs for this course will be conducted online. During your first lab meeting, on July 1 or 2, your lab TA will conduct a Zoom meeting and will go over the details and mechanics of the labs. The TA will also share the schedule for labs and their due dates.

3. SUPPORT

You have a variety of opportunities for support available to you.

3.1 LECTURE

Do not underestimate the value of questions during the lecture period. In large lectures, many students are reluctant to pose questions that they fear might seem silly to their instructor or to their peers. Almost always, if one student asks a question, there are several other students who were wondering about the same issue. Often such questions tell the instructor what material might benefit from a more detailed discussion.

3.2 INSTRUCTOR OFFICE HOURS

I will have three hours of office hours each week. Office hours will be held in my personal Zoom meeting room, which can be accessed via <https://usc.zoom.us/j/9724034151>. You can also make an appointment to talk to me if you cannot make it to any of the office hours listed on the first page of the syllabus. In this case, it is best to contact me by email at least one day before you’d like to meet, or see me immediately after class.

3.3 ELECTRONIC ASSISTANCE

Everyone registered in this course should find a link to the course in their *Blackboard* account. All information about the course will be posted on *Blackboard* at <http://blackboard.usc.edu>.

At this address, you will find this Syllabus, important announcements, homework sets, etc. Solutions to your homework sets (after the due date) will be placed on *Blackboard*.

4. OBTAINING YOUR GRADES

You will be able to access your grades in Astronomy 200 via *Blackboard* at <http://blackboard.usc.edu>.

5. STUDENT OMBUDSMAN

All courses in the Department of Physics & Astronomy have an assigned Student Ombudsman to serve students as a confidential, neutral, informal, and independent resource when they wish to discuss issues concerning their course without directly confronting their instructor. The Student Ombudsman for this course is Prof. Chris Gould (gould@usc.edu, 213-740-1101, SSC 204).

6. FEEDBACK

Feedback regarding all aspects of these lectures is very much appreciated and welcome at any time. Please get in touch with your instructor via email, after lectures, or during office hours.

7. STATEMENT ON ACADEMIC CONDUCT AND SUPPORT SYSTEMS

7.1 ACADEMIC CONDUCT:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, “Behavior Violating University Standards” policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.

7.2 SUPPORT SYSTEMS:

Student Counseling Services (SCS) – (213) 740-7711 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. engemannshc.usc.edu/counseling

National Suicide Prevention Lifeline – 1 (800) 273-8255

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. www.suicidepreventionlifeline.org

Relationship and Sexual Violence Prevention Services (RSVP) – (213) 740-4900 – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender-based harm. engemannshc.usc.edu/rsvp

Sexual Assault Resource Center

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: sarc.usc.edu

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086

Works with faculty, staff, visitors, applicants, and students around issues of protected class. equity.usc.edu

Bias Assessment Response and Support

Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. studentaffairs.usc.edu/bias-assessment-response-support

The Office of Disability Services and Programs

Provides certification for students with disabilities and helps arrange relevant accommodations. dsp.usc.edu

Student Support and Advocacy – (213) 821-4710

Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. studentaffairs.usc.edu/ssa

Diversity at USC

Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. diversity.usc.edu

USC Emergency Information

Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible. emergency.usc.edu

USC Department of Public Safety – UPC: (213) 740-4321 – HSC: (323) 442-1000 – 24-hour emergency or to report a crime.

Provides overall safety to USC community. dps.usc.edu

8. SOME USEFUL DATES

July 1	Summer Session classes begin
July 9	Last day to add this class
July 14	Midterm 1
July 23	Midterm 2
August 4	Last day to drop class with mark of “W”
August 4	Midterm 3
August 11	Final Exam

9. COURSE SCHEDULE

You should read through the relevant chapters prior to coming to the lectures each week, and review them again after each lecture before attempting the homework problems.

Week	Start date	Required reading
1	7/1	Lecture 1 (Chapter 1): A Universe of life? Lecture 2 (Chapter 2): A brief history of astronomy
2	7/6	Lecture 3 (Chapter 3): Our toolbox of physical laws Lecture 4 (Chapter 3): Formation of the Solar System Lecture 5 (Chapter 3): Birth of the Universe
3	7/13	Lecture 6 (Chapter 4): The habitability of Earth Lecture 7 (Chapter 5): Life on Earth Lecture 8 (Chapter 6): Origin and evolution of life on Earth
4	7/20	Lecture 9 (Chapters 7 and 9): Searching for life in the Solar System Lecture 10 (Chapter 8): Mars Lecture 11 (Chapter 11): The Sun, our star
5	7/27	Lecture 12 (Chapter 11): Surveying the sun and stars Lecture 13 (Chapter 11): Star Stuff: the life cycle of stars Lecture 14 (Chapter 11): Extrasolar planetary systems
6	8/3	Lecture 15 (Chapter 10): The nature and evolution of habitability Lecture 16 (Chapter 12): The search for extraterrestrial intelligence Lecture 17 (Chapter 13): Interstellar travel
7	8/10	Lecture 18 (Chapter 13): The Fermi paradox