



AST 184L: Life in the Universe (Laboratory)

Fall 2020

Instructor: Anna Engle

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Office: Peterson Hall, Rm. 313

Office Hours (Zoom only): Wednesdays 1 - 3pm or by appointment

Link: <https://us02web.zoom.us/j/81162558775?pwd=d3RaZ3Q1aGY0Uy9mNGFrVXpqUIhPUT09>

Password: planets

Meeting Time: 6:30 - 9:00pm

Location: Zoom

Quick Note

I think we can all agree that this semester will be strange, partly due to the stresses of being amidst a pandemic but also due to our new online-only format for this lab. Let's all take this into consideration as we progress through the semester. I am here to help, so don't hesitate to reach out if any problems arise.

Course Description

This one-credit laboratory complements the lecture course AST 183: Life in the Universe, a multidisciplinary exploration of modern scientific inquiry into the question of life's origin, evolution, and future place in the Universe. Due to this course being taught online, students will not have the opportunity to work in a physical lab setting but will occasionally be presented with hands-on experiences. There will also be some suggested 'field trips' that students can take around Flagstaff. If you are not currently in the area, a Google Earth view will be provided, so that you may still gain the experience.

Course Objectives

This lab will broadly focus on:

1. The astronomical setting for life as we know it
2. Nearby stars and the prospects for life
3. The evidence used to construct our picture of the history of complex life on Earth

Course Structure

We endeavor to deliver quality instruction while also keeping everyone as safe as possible during the COVID-19 pandemic. Because of this, we have opted to switch AST184 to an online-only format for fall 2020. Classes will be held on Zoom and will entail a short presentation on the material (~15 to 20 minutes) at the beginning, followed by everyone joining a breakout

room. Each breakout room will have roughly 4-5 people and you will work as a group to complete that week's lab. **However, due to the new online formatting of the class, the structure is subject to change and I will inform you ahead of time if any changes are made.**

Lab Reports

Each lab will be accompanied by a lab report. Because of the online format, and the possibility that I will not be able to answer everyone's questions during class time, I ask that you submit your lab reports no later than the next day (Wednesday) by noon. However, submitting them at the end of class time is recommended and appreciated.

The worksheets for the reports will be made available on BBLearn shortly before the beginning of class and should be submitted to BBLearn by the end of class. The expectation is that the group will designate a transcriber who is in charge of filling out the lab report and submitting it to BBLearn with everyone's names from the group written at the top. Note that a group will only submit **one (1)** packet for each breakout room and everyone in that group will receive the same grade.

Since everything will be submitted online, there are a few routes that can be taken to upload sketches (if any). 1) Use a tablet and stylus to draw directly onto your lab report, 2) Draw by hand and then take a picture using a phone, tablet, or camera and then attach to the image to the document, 3) Draw by hand and scan in with a scanner and then attach the image to the document. If none of these options are feasible, please contact me and we will figure out an accommodation.

Grading System

The breakdown of your grade is as follows:

<i>Lab Reports</i>	<i>80%</i>
<i>Midterm Quiz</i>	<i>10%</i>
<i><u>Final Quiz</u></i>	<i><u>10%</u></i>
<i>Total</i>	<i>100%</i>

The approximate grading scale will be:

$$A \geq 90\% \quad B \geq 80\% \quad C \geq 70\% \quad D \geq 60\%$$

I will take attendance every week and compare to those who submitted lab reports. If your name appears on a lab report but not on the attendance roster, you will be notified and receive a zero for the lab report for that week. If this happens three times you will be reported for cheating.

Make Ups

The quizzes **cannot** be made up. If you know you will be unable to attend either quiz, contact me and we will arrange for you to take it another time. As for the lab reports, you can make up a

total of three throughout the semester: you are allowed to make up one with no questions asked and two with a viable excuse.

Course Schedule

The following course schedule includes the lab topics, dates of quizzes, and additional material. In the schedule below, if a topic in the Readings/Videos section says (Reading) beside it, you are expected to read the article prior to class. Articles will become available no later than one week before the intended lab, and will be shared through both email and BBLearn. I will send out an email every Wednesday with the reading for the following week, as well as post it to BBLearn.

This schedule is subject to change, and any changes will be discussed with the class prior to their implementation.

Week	Date	Topic	Readings/Videos
1	8/18	Lab Introduction/How We Search For Life	Scientific Notation
2	8/25	The Size of Astronomy	Powers of Ten
3	9/1	The Drake Equation	Fermi Paradox: Where Are the Aliens? (Reading)
4	9/8	The Search for Exoplanets	Guest Speaker
5	9/15	Habitable Zone	What is the Habitable Zone? (Reading)
6	9/22	Geology Basics	Guest Speaker
7	9/29	Midterm Quiz / Age Relationships of Planetary Surfaces	Earth Science: How Old Is Everything?
8	10/6	Exploring the Grand Canyon	National Geographic Documentary
9	10/13	Natural Selection and Mass Extinction	SciShow: Mass Extinction
10	10/20	Life As We Know It: Carbon and Water	Guest Speaker
11	10/27	Life As We Kind of Know It: Extremophiles	Guest Speaker
12	11/3	Life As We Do Not Know It: Silicon-Based Life	The X-Files: Firewalker
13	11/10	Exploring Mars	NASA Science Live: Perseverance Mars Rover & the Search for Ancient Life
14	11/17	Final Quiz	

Northern Arizona University, Approved Policy Statements

Academic Integrity: NAU expects every student to firmly adhere to a strong ethical code of academic integrity in all their scholarly pursuits. The primary attributes of academic integrity are honesty, trustworthiness, fairness, and responsibility. As a student, you are expected to submit original work while giving proper credit to other people's ideas or contributions. Acting with academic integrity means completing your assignments independently while truthfully acknowledging all sources of information, or collaboration with others when appropriate. When you submit your work, you are implicitly declaring that the work is your own. Academic integrity is expected not only during formal coursework, but in all your relationships or interactions that are connected to the educational enterprise. All forms of academic deceit such as plagiarism, cheating, collusion, falsification or fabrication of results or records, permitting your work to be submitted by another, or inappropriately recycling your own work from one class to another, constitute academic misconduct that may result in serious disciplinary consequences. All students and faculty members are responsible for reporting suspected instances of academic misconduct. All students are encouraged to complete NAU's online academic integrity workshop available in the E-Learning Center and should review the full academic integrity policy available at <https://policy.nau.edu/policy/policy.aspx?num=100601>.

Course Time Commitment: Pursuant to Arizona Board of Regents guidance (Academic Credit Policy 2-224), for every unit of credit, a student should expect, on average, to do a minimum of three hours of work per week, including but not limited to class time, preparation, homework, and studying.

Disruptive Behavior: Membership in NAU's academic community entails a special obligation to maintain class environments that are conducive to learning, whether instruction is taking place in the classroom, a laboratory or clinical setting, during course-related fieldwork, or online. Students have the obligation to engage in the educational process in a manner that does not breach the peace, interfere with normal class activities, or violate the rights of others. Instructors have the authority and responsibility to address disruptive behavior that interferes with student learning, which can include the involuntary withdrawal of a student from a course with a grade of "W". For additional information, see NAU's disruptive behavior policy at <https://nau.edu/university-policy-library/disruptive-behavior>.

Nondiscrimination and Anti-harassment: NAU prohibits discrimination and harassment based on sex, gender, gender identity, race, color, age, national origin, religion, sexual orientation, disability, or veteran status. Due to potentially unethical consequences, certain consensual amorous or sexual relationships between faculty and students are also prohibited. The Equity and Access Office (EAO) responds to complaints regarding discrimination and harassment that fall under NAU's Safe Working and Learning Environment (SWALE) policy. EAO also assists with religious accommodations. For additional information about SWALE or to file a complaint, contact EAO located in Old Main (building 10), Room 113, PO Box 4083, Flagstaff, AZ 86011, or by phone at 928-523-3312 (TTY: 928-523-1006), fax at 928-523-9977, email at equityandaccess@nau.edu, or via the EAO website at <https://nau.edu/equity-and-access>.

Title IX: Title IX is the primary federal law that prohibits discrimination on the basis of sex or gender in educational programs or activities. Sex discrimination for this purpose includes sexual

harassment, sexual assault or relationship violence, and stalking (including cyber-stalking). Title IX requires that universities appoint a “Title IX Coordinator” to monitor the institution’s compliance with this important civil rights law. NAU’s Title IX Coordinator is Pamela Heinonen, Director of the Equity and Access Office located in Old Main (building 10), Room 113, PO Box 4083, Flagstaff, AZ 86011. The Title IX Coordinator is available to meet with any student to discuss any Title IX issue or concern. You may contact the Title IX Coordinator by phone at 928-523-3312 (TTY: 928-523-1006), by fax at 928-523-9977, or by email at pamela.heinonen@nau.edu. In furtherance of its Title IX obligations, NAU will promptly investigate and equitably resolve all reports of sex or gender-based discrimination, harassment, or sexual misconduct and will eliminate any hostile environment as defined by law. Additional important information about Title IX and related student resources, including how to request immediate help or confidential support following an act of sexual violence, is available at <http://nau.edu/equity-and-access/title-ix>.

Accessibility: Professional disability specialists are available at Disability Resources to facilitate a range of academic support services and accommodations for students with disabilities. If you have a documented disability, you can request assistance by contacting Disability Resources at 928-523-8773 (voice), 928-523-6906 (TTY), 928-523-8747 (fax), or dr@nau.edu (e-mail). Once eligibility has been determined, students register with Disability Resources every semester to activate their approved accommodations. Although a student may request an accommodation at any time, it is best to initiate the application process at least four weeks before a student wishes to receive an accommodation. Students may begin the accommodation process by submitting a self-identification form online at <https://nau.edu/disability-resources/student-eligibility-process> or by contacting Disability Resources. The Director of Disability Resources, Jamie Axelrod, serves as NAU’s Americans with Disabilities Act Coordinator and Section 504 Compliance Officer. He can be reached at jamie.axelrod@nau.edu.

Misconduct in Research: As noted, NAU expects every student to firmly adhere to a strong code of academic integrity in all their scholarly pursuits. This includes avoiding fabrication, falsification, or plagiarism when conducting research or reporting research results. Engaging in research misconduct may result in serious disciplinary consequences. Students must also report any suspected or actual instances of research misconduct of which they become aware. Allegations of research misconduct should be reported to your instructor or the University’s Research Integrity Officer, Dr. David Faguy, who can be reached at david.faguy@nau.edu or 928-523-6117. More information about misconduct in research is available at <https://nau.edu/university-policy-library/misconduct-in-research>.

Sensitive Course Materials: University education aims to expand student understanding and awareness. Thus, it necessarily involves engagement with a wide range of information, ideas, and creative representations. In their college studies, students can expect to encounter and to critically appraise materials that may differ from and perhaps challenge familiar understandings, ideas, and beliefs. Students are encouraged to discuss these matters with faculty.

COVID-19 Requirements and Information

The following statements in red set forth in this document’s first section are specific to NAU’s response to the COVID-19 situation. The requirements outlined below are

mandatory until further notice. They are based upon current public health conditions and guidance and may change as circumstances warrant or new information becomes available. Additional information about the University's response to COVID-19 is available from the **Jacks are Back!** web page located at <https://nau.edu/jacks-are-back/lumberjack-responsibilities>.

Face Covering and Physical Distancing Requirements: Appropriate face masks or other suitable face coverings must be worn by all individuals when present in classrooms, laboratories, studios, and other dedicated educational spaces. To maximize the benefits of physical distancing as an important strategy to help reduce community transmission of the SARS-CoV-2 virus, instructors may implement mandatory student seating arrangements or specific seat assignments. Instructors may remove students who do not cooperate with these requirements from the instructional space in the absence of an approved accommodation arranged through Disability Resources. Failing to comply with these requirements may constitute a violation of the university's *Disruptive Behavior in an Instructional Setting* policy available at <https://nau.edu/university-policy-library/disruptive-behavior>.

Use NAUFlex to Help Maintain Physical Distancing: NAUFlex (available at <https://nau.edu/nauflex/student>) is designed to help all students actively participate in their coursework during the required day and time of a course when they are not physically present in the classroom. This course design model allows students to be fully engaged with faculty and peers and receive the high-quality educational experience for which NAU is known.

Class Session Recordings for Students and Faculty Use Only: Certain class sessions may be audio or video recorded to help reinforce live instruction during the COVID-19 pandemic. These recordings are for the sole use of the instructor and students enrolled in the course. Recordings will be stored in approved, accessible repositories. By enrolling, students agree to have their image and classroom statements recorded for this purpose, to respect the privacy of their fellow students, and university-owned intellectual property (including, but not limited to, all course materials) by not sharing recordings from their courses. Questions regarding restrictions on the use of classroom audio or video recordings may be addressed to the appropriate academic unit administrator.