AST181L: Introduction to Observational Astronomy (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=d3RaZ3Q1aGY0Uy9mNGFrVXpqUlhPUT09
Password: planets
Meeting Time: 7:30 - 10:00pm
Sections: AST181-003 (Wednesdays), AST181-004 (Thursdays)
Location: Zoom / Physical Sciences (Building 19), Rm. 218
Pre- and co-requisites: AST180 or AST180H

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 the new NAUFlex 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.

Required Materials

A pen/pencil, tablet, or other device suitable for sketching things like the phase of the moon or constellations in the sky. A digital camera (like on your phone, tablet, or computer) or a scanner (like those in the Cline Library) if you wish to print pages to work on; for example, you might prefer sketching the phase of the moon on paper, then submit that sketch through BBLearn.

Course Description

This one-hour course serves as an introduction to observational astronomy. We will be concentrating on the night sky and the use of small telescopes— specifically the 0.5 m Barry Lutz Telescope (BLT) telescope—when the sky is clear, and on exploring the motions of astronomical objects and other key concepts when the sky is cloudy. When paired with the three-hour lecture course, Astronomy 180, the two courses meet the four-hour laboratory science component for liberal studies. The thematic focus of this course is Technology and its Impact, since we will be examining how the use of telescopes changes the way we see the sky. The skills we will be concentrating on are the use of technology, specifically that of the telescopes and/or computers; the logic of scientific inquiry, which is at the heart of each

laboratory exercise; quantitative reasoning as developed during your analysis of your observations; and spatial reasoning as developed during studies of the celestial sphere and the motions of the sun and planets.

Course Objectives

After successful completion of this course, you will be able to:

1. Point out the basic stars and constellations in the night sky.
2. Use a small telescope to examine planets and other bright objects.
3. Sketch the daily and annual motions of the sun and other astronomical objects.
4. Use a variety of computer programs to illustrate basic astronomical concepts.
5. Use the method of scientific inquiry to explain observational phenomena.

Course Structure

This course will utilize the new NAUFlex system to deliver instruction while also adhering to safety practices due to COVID-19. Students will be divided into two sections, A and B, and will alternate between in person and online instruction. That is, section A will attend in person and section B will attend online the first week, followed by section B attending in person and section A attending online the second week, and so on. Due to capacity restrictions and sanitation concerns, we will not be using telescopes in person but do have the opportunity to remotely view objects via the BLT. When we use the BLT, a Telescope Operator (also known as a TO) will drive the telescope for us and send us images in real time.

Lab ordering

In the past, we have required that lab manuals be purchased by students to be utilized throughout the semester. For fall 2020, we will be providing the lab worksheets each week but you may notice that the numbering is out of order. Observing is dependent on clear skies, and therefore the lab we complete in a given week hangs on whether the weather is cooperating.

Lab Reports

Virtually all lab projects will involve lab reports. 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. However, if you need extra time, you may turn them in as late as 5:00 p.m. on the Friday following that lab project. There will be some lab assignments given as take-home projects; these are to be completed outside of class and turned in as directed. In some instances you will need to attach sketches to your lab reports or take-home projects.

Since everything will be submitted online, there are a few routes that can be taken to upload your sketches. 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 accommadation.

Quizzes
Typically, there will be a weekly quiz on the material covered in the previous week's lab. Each quiz will consist of one or two short essay questions on the most important concepts.

Final Quiz
The final quiz will have questions very similar to those on the previous quizzes. The final will be given during finals week, but because of the situation with COVID-19 be sure to check the NAU finals schedule for an exact date and time.

Grading System
Your grade will be weighted as follows:

Lab Reports	*60%*
Weekly Quizzes	*20%*
Final Quiz	*20%*
Total	***100%***

The instructor will drop your single lowest lab grade, and your two lowest quiz grades. The approximate grading scale will be:

A ≥ 90% B ≥ 80% C ≥ 70% D ≥ 60%

Make-ups
There will be no make-up BLT laboratories. Some indoor labs can be made up, but *only with prior permission* of the instructor. If you have an institutional excuse and the missed lab cannot be made up, the instructor will substitute the average of all your other lab grades for that lab. Make-up quizzes will be given only with an institutional excuse, or at the discretion of the instructor. (Please note that being ill does not constitute an institutional excuse. An institutional excuse is one that has been signed by the Dean of a college for academic reasons, or by the Dean of students for a non-academic reason.)

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.