

## Department of Astronomy and Planetary Science

# **Introduction to Observational Astronomy (AST 181) Syllabus**

### **General Information**

Instructor:	Sam Hemmelgarn
Email:	sph227@nau.edu
Office:	Peterson, Rm 113
Office Hours:	Wednesdays, 11am - 12pm or by appointment
Meeting Time:	Wednesday, 7:30pm - 10pm, Physical Sciences Rm 321

### **Meeting Place**

AST 181 will meet in the Physical Sciences Building (Room 218 or 321) or at the Campus Observatory. Your instructor will inform you where to meet each week on Canvas.

### **Pre-Requisites**

AST 181 has AST 180 as a co-requisite. In other words, you must have already taken AST 180 or be taking it concurrently with AST 181.

### **Required Materials**

A pencil and a calculator. We will provide a red flashlight. We will also use the Celestron Sky Portal app for several of the labs. If you have issues downloading the app let your instructor know.

### **Course Description**

AST 181 is an introduction to observational astronomy. We will concentrate on learning about the diurnal (daily) and annual motions of celestial objects, recognizing different constellations and stars in the night sky, and using small telescopes. When AST 181 is paired with AST 180, the three-hour lecture class, the pair meets the four-hour laboratory science component for liberal studies.

### **Course Objectives**

After successful completion of this course, you will

- be able to identify bright stars and constellations in the sky.

- understand and predict celestial objects' diurnal (daily motion) in the sky.
- understand and predict the annual motion of celestial objects in the sky.
- be able to use a small telescope with an eyepiece to observe the Moon, planets, and bright deep-sky objects.
- be able to use a small telescope with a camera to capture images of celestial objects.

### **Indoor vs. Outdoor Labs**

Outdoor labs will occur on reasonable clear nights at the Campus Observatory, and Indoor Labs will occur on cloudy nights in the Physical Sciences Building, Rooms 218 or 321. Your lab instructor will set up a way to inform you whether a night's lab is outdoors or indoors. Location may change up to an hour beforehand.

### **Lab Reports**

You will work on and turn in a lab report nearly every week. Your report must be turned in by the end of the lab period. A few lab reports will be given as take-home projects. These labs will be completed outside of class and submitted to your instructor at a given date.

### **Quizzes**

There will be a quiz on the previous week's lab every week. The quizzes will consist of 2-3 questions from a previous lab. The quizzes will be given at the start of the lab period.

**Constellation Quiz:** Will take place on the 1<sup>st</sup> clear night (no full Moon) no sooner than 2 weeks after Outdoor Lab 2, Constellations.

### **Final Examination**

The final exam will have questions like the weekly quizzes. The final will be given during finals week at 8:00 p.m. on the same day of the week as your class, in Room 218 or 321 of the Physical Science Building.

### **Grading System**

The weights of the different graded items will go toward your final grade as follows:

- |                      |      |
|----------------------|------|
| • Lab Reports        | ~70% |
| • Constellation Quiz | ~10% |
| • Weekly Quizzes     | ~10% |
| • Final Exam         | ~10% |

Your instructor will drop your lowest lab grade and your lowest quiz grade.

The approximate grading scale is:

- A > 90%
- B > 80%
- C > 70%
- D > 60%

### **Make-Ups**

There will be no make-up labs, quizzes, or assignments. If you have an institutional excuse, the instructor will substitute the average of all your other lab grades for that lab and quiz grade. Please note that being ill does not constitute an institutional excuse. The Dean of a College signs an institutional excuse for academic reasons. The Dean of Students signs an institutional excuse for a non-academic reason.

### **Academic Integrity**

The Department of Astronomy and Planetary Science has zero tolerance for academic dishonesty. Examples of academic dishonesty in AST 181 include plagiarism and inventing data without experimenting. Please see the NAU Student Handbook for a full description of academic dishonesty and the penalties. Please note that we recognize that you work together during lab periods; however, your write-up must be your original work. Answers that are word-for-word identical to those of your lab partners are considered plagiarism. If your instructor suspects you committed an act of academic dishonesty, they will begin NAU's formal process of investigating the act. If the act is substantiated, you will receive a zero for the assignment, and your name will be entered into the NAU academic dishonesty database. Repeated entries of academic dishonesty result in increasing penalty severity.

The following are some unacceptable behaviors that will be considered acts of academic dishonesty. Note that this is not a comprehensive list.

- Copying or seeking information from another lab group without the express permission of the lab instructor.
  - Bringing a completed or partially completed lab to the lab period.
  - Having material on your desk or in your work area other than the lab write-up for that week for which your TA has not approved.
  - Using an electronic device, such as a smartphone or tablet, during the lab period.
- The exception to this rule is using the Sky Portal app when applicable.

### **Tips for Succeeding in this Course**

The key to succeeding in AST 181 is understanding the material rather than mechanically filling out lab reports. Don't stand by and watch your lab partner figure out the answers. If you receive less than a perfect score on the weekly quiz, discuss the material with your instructor to ensure you understand it. During the winter months the outdoor labs will be quite cold so dress appropriately.

**Attendance is essential!!**

# NAU Career Ready Agenda

## 100% Career Ready:

One of the primary goals of this course is to provide skills that are in-demand from STEM employers to help NAU CEFNS students pursue careers of confidence and lives of purpose. Below is a list of in-demand skills from the National Association of Colleges and Employers (NACE) that students may be able to practice in this course:

1. Career & Self-Development: Proactively develop oneself and one's career through continual personal and professional learning, awareness of one's strengths and weaknesses, navigation of career opportunities, and networking to build relationships within and without one's organization.
2. Communication: Clearly and effectively exchange information, ideas, facts, and perspectives with persons inside and outside of an organization.
3. Critical Thinking: Identify and respond to needs based upon an understanding of situational context and logical analysis of relevant information.
4. Equity & Inclusion: Demonstrate the awareness, attitude, knowledge, and skills required to equitably engage and include people from different local and global cultures. Engage in anti-racist practices that actively challenge the systems, structures, and policies of racism.
5. Leadership: Recognize and capitalize on personal and team strengths to achieve organizational goals.
6. Professionalism: Knowing work environments differ greatly, understand and demonstrate effective work habits, and act in the interest of the larger community and workplace.
7. Teamwork: Build and maintain collaborative relationships to work effectively toward common goals, while appreciating diverse viewpoints and shared responsibilities.
8. Technology: Understand and leverage technologies ethically to enhance efficiencies, complete tasks, and accomplish goals

## Career Ready Resources.

LinkedIn:

CEFNS Career Development

[www.linkedin.com/in/cefns-career-development-072715233](https://www.linkedin.com/in/cefns-career-development-072715233)

NAU Career Development

<https://www.linkedin.com/company/nau-career-development/>

Handshake:

<https://nau.joinhandshake.com/login>

Udemy: Online courses and career searching advice

<https://in.nau.edu/its/udemy/>

Log in with your NAU email account and search 'NAU Career Steps'

O\*net Online: Occupation exploration reports

<https://www.onetonline.org/>

## **SYLLABUS 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://www9.nau.edu/policies/Client/Details/1443?whoIsLooking=Students&pertainsTo=All>

### **ARTIFICIAL INTELLIGENCE**

Artificial intelligence (AI) technologies bring both opportunities and challenges. Ensuring honesty in academic work creates a culture of integrity and expectations of ethical behavior. The use of these technologies can depend on the instructional setting, varying by faculty member, program, course, and assignment. Please refer to course policies, any additional course-specific guidelines in the syllabus, or communicate with the instructor to understand expectations. NAU recognizes the role that these technologies will play in the current and future careers of our graduates and expects students to practice responsible and ethical use of AI technologies to assist with learning within the confines of course policies.

### **COPYRIGHT INFRINGEMENT**

All lectures and course materials, including but not limited to exams, quizzes, study outlines, and similar materials are protected by copyright. These materials may not be shared, uploaded, distributed, reproduced, or publicly displayed without the express written permission of NAU. Sharing materials on websites such as Course Hero, Chegg, or related websites is considered copyright infringement subject to United States Copyright Law and a violation of NAU Student Code of Conduct. For additional information on ABOR policies relating to course materials, please refer to ABOR Policy 6-908 A(2)(5).

### **COURSE TIME COMMITMENT**

Pursuant to Arizona Board of Regents guidance (ABOR Policy 2-224, Academic Credit), each unit of credit requires a minimum of 45 hours of work by students, including but not limited to, class time, preparation,

homework, and studying. For example, for a 3-credit course a student should expect to work at least 8.5 hours each week in a 16-week session and a minimum of 33 hours per week for a 3-credit course in a 4-week session.

## 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 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 in an Instructional Setting 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, veteran status and genetic information. Certain consensual amorous or sexual relationships between faculty and students are also prohibited as set forth in the Consensual Romantic and Sexual Relationships policy. The Equity and Access Office (EAO) responds to complaints regarding discrimination and harassment that fall under NAU's Nondiscrimination and Anti-Harassment policy. To report a concern related to possible unlawful discrimination or harassment or to request a time to meet, please use the [Report an Issue Form](#). To file a complaint, please submit the online [Complaint Form](#). EAO also assists with religious accommodations. To request a religious accommodation, please use the [Religious Accommodation Request Intake Form](#). EAO additionally provides access to lactation spaces, and please use to the [Lactation Space Request Form](#) to request use of a location. For additional information about nondiscrimination or anti-harassment, contact EAO at [EquityandAccess@nau.edu](mailto:EquityandAccess@nau.edu), or visit the EAO website at <https://nau.edu/equity-and-access>. The EAO is located in Old Main on the first floor.

## TITLE IX

Title IX of the Education Amendments of 1972, as amended, protects individuals from discrimination based on sex in any educational program or activity operated by recipients of federal financial assistance. In accordance with Title IX, Northern Arizona University prohibits discrimination based on sex or gender in all its programs or activities. Sex discrimination includes sexual harassment, sexual assault, relationship violence, and stalking. NAU does not discriminate on the basis of sex in the education programs or activities that it operates, including in admission and employment. NAU is committed to providing an environment free from discrimination based on sex or gender and provides a number of supportive measures that assist students, faculty and staff employees, and covered guests.

One may direct inquiries concerning the application of Title IX to either or both the university Title IX Coordinator or the U.S. Department of Education, Assistant Secretary, Office of Civil Rights. You may contact NAU's Title IX Coordinator at [titleix@nau.edu](mailto:titleix@nau.edu) or by phone at 928-523-5434. In furtherance of its Title IX obligations, NAU promptly will investigate or equitably resolve all reports of sex/gender-based discrimination, harassment, or sexual misconduct and will eliminate any hostile environment as defined by law. To submit a report, please use the [File a Report Form](#). The Office for the Resolution of Sexual Misconduct (ORSM): Title IX Institutional Compliance, Prevention & Response addresses matters that fall under the university's [Sexual Misconduct Policy](#). ORSM also facilitates reasonable modifications for pregnant or parenting individuals. Additional important information and related resources, including how to request help or confidential support following conduct covered by the Sexual Misconduct Policy, is available on the [ORSM web site](#), and you also may contact the office at

[titleix@nau.edu](mailto:titleix@nau.edu). The ORSM is located in Gammage on the third floor.

## **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), 928-523-8747 (fax), or [dr@nau.edu](mailto: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](mailto:jamie.axelrod@nau.edu).

## **RESPONSIBLE CONDUCT OF RESEARCH**

Students who engage in research at NAU must receive appropriate Responsible Conduct of Research (RCR) training. This instruction is designed to help ensure proper awareness and application of well-established professional norms and ethical principles related to the performance of all scientific research activities. More information regarding RCR training is available at <https://nau.edu/research/compliance/research-integrity>.

## **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, Scott Pryor, who can be reached at [scott.pryor@nau.edu](mailto:scott.pryor@nau.edu) or 928-523-5927. 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.