

Department of Astronomy and Planetary Science AST 201: Introduction to Indigenous Astronomy Spring 2021

Meeting Times

- **Asynchronous Learning:** Online Blackboard Learn Course Page
- **Synchronous Classes:** TTh 9:35—10:50 am through Zoom
Your NAU Sign-in to Zoom is required:
 - 1) click on "Sign In with SSO" when you open your Zoom, and then type "nau".zoom.us, or
 - 2) go to <https://nau.zoom.us> and click "Sign in" before you click the Zoom link below.

Zoom Link: <https://nau.zoom.us/j/84598922808?pwd=bU1KQVhqWTVlMzdKTEJSV1puWFU2QT09>
Meeting ID: 845 9892 2808 Password: grogu (189272 if you're using a phone)

Credit/ Pre- or co-requisites

3 credit hours, no pre- or co-requisites

Mode of Instruction

This course is fully remote the whole semester, with content for Asynchronous Learning (required) and Synchronous Classes (highly encouraged) of discussions and enhancement. This course is especially designed to be fully transparent, inclusive, and accessible to all students.

- **Asynchronous Learning** content includes: 1) Online Lectures mixed with Youtube videos, 2) STEP3 Questions and Reading Quiz for each Unit, 3) Mini Projects to be posted and mostly shared in BBLearn Discussion Boards, and 4) Online Midterm and Final Exams.
- **Synchronous Classes** are designed to follow this flow— *Introduction Tuesday, Indigenous & Astronomy Thursday*. Every Tuesday, a brief introduction and guide for weekly materials, mini projects, and dues. Every Thursday, a brief lesson to enhance and supplement content related to Indigenous People, as well as current Astronomy-related topics. All followed by Discussions or Q&A. Synchronous Class attendance is not required, however joining any Synchronous Class will earn students 1 extra point each. All Synchronous Classes will be recorded, and additional materials discussed in Synchronous Classes will not be tested.

Instructor Contact & Availability

Dr. Lisa Chien

Email: Lisa.Chien@nau.edu

Office Hours: Please join in to Synchronous Classes to ask me questions (and earn 1 extra point), or email me anytime. I will get back to you as soon as I can, definitely within 24 hrs.

Grader: Sarah Stefl (sks385@nau.edu)

Course Purpose & Student Learning Outcome

When we think of astronomy, we often think of western modern astronomy. However, indigenous peoples have been developing complex systems of understanding the heavens all around the world since before the development of modern astronomical thinking. The course will introduce ancient and living astronomies of native peoples and compare those systems with modern astronomy and planetary science. We will examine how indigenous cultures reference the skies and how they integrate humans into the cosmos. We will examine the importance of worldview and how it affects a person's perception of the universe. The course will focus on observation-based astronomy and the use of technology in the study of indigenous astronomy. It will also examine

the use of cultural ethics in the study of space science and traditional native astronomy. The primary cultural focus will be on astronomies of the American Southwest.

Key themes that we will examine throughout the course are— **Valuing the diversity of human experience**, **Environmental consciousness**, and **Technology and its impact**. We will accomplish this by examining the astronomies of different indigenous cultures, their connection to the environment, and the use of technology in the past and present-day study of astronomy. This course satisfies **Cultural Understanding** and **US Ethnic Diversity** Distribution Requirement and is designed to appeal to a broad audience. This requirement will be addressed through the comparisons of (a) ancient and living astronomies of native peoples with western astronomy and modern advances in space science exploration and of (b) the cultural ethics of traditional native astronomy with those of modern space science. This course will address several of the liberal studies essential skills. It will focus on **Critical Thinking**, **Ethical Reasoning**, **Scientific Inquiry**, and the **Use of Technology**.

This course has several objectives and learning outcomes that will be addressed during the lecture and in the assigned reading. By the end of the semester, students will be able to

1. describe the role of diverse cultures in understanding the relationship of man to the universe we live in.
2. use critical reasoning to understand the ways of knowing and resulting narratives associated with indigenous cosmologies, cosmologies widely accepted in the western pre-scientific era, and those of modern science.
3. use knowledge gained from direct observation, critical thinking and technology-based observations and analyses to locate the moon, planets, and stars that are important to indigenous peoples and describe their cycles, phases, physical characteristics, and significance in diverse cultural settings.
4. learn how ancient and modern indigenous cultures often practiced observational astronomy in ways that resemble scientific practice.

Required Materials & Technology

None, however you need to have stable internet connection in order to watch online lecture videos, participate online assignments, and finish online exams.



*This semester we will be using an interactive astronomy software developed by University of Nebraska Lincoln, called **ClassAction**, to enhance online learning. It is essential to your understanding and **required** to answer **STEP3 Questions** and **Reading Quizzes** on **BBLearn** (see below). Please go to [this page](#) to download and install it on your computer (super easy too!). You can also watch the video on their website to see details of installation (on both Windows and Mac). Please contact Dr. Chien (lisa.Chien@nau.edu) ASAP if you cannot install the software for any reasons.*

Grading System & Late Policy

Assessment	Points
Participation	180
Reading Quiz	100
Mini Project	60
Midterm Exam	70
Final Exam	90

Grade	Total Points You Earned
A	448 — 500 or more
B	398 — 447
C	348 — 397
D	298 — 347
F	0 — 297

Connection Issues and Late Submission Policy for all Assignments:

If you encounter any difficulties accessing any assignments on BBLearn, first keep trying with different internet connections, browsers, or devices. If problems still exist and it is getting close to 6 hours before the due date, *i.e.*, 6:00pm on Fridays and Mondays, please email me as soon as you can and I can give you an extension for **another 24 hours**. **Please, you have to let me know that you're having difficulties, otherwise late submissions for**

- **STEP3 Questions: 2 points off**
- **Reading Quiz: 2 points off**
- **Mini Projects: 5 points off**
- **Exams: count as 0 points**

Assignments & Assessments

1. STEP 3 Questions

In each Section of each Unit, there is a small portion of participation questions based on the Mini Lectures. These are called **STEP3: Unit X.X Questions** on BBLearn. These Questions are administered as a "Test/Quiz" format on BBLearn, however you can have unlimited attempts, and only the highest grade is counted BEFORE the due date. **Each Unit has 3 to 4 Sections, and so 16 to 17 Participation Points. No Participation points are dropped, so total Participation points from all Units are 180 points. These Participation Questions are due every Friday.**

2. Reading Quiz

Reading quizzes are posted on BBLearn, which will test students' comprehension of the material covered in the assigned reading. You have 2 attempts, and the timer is set to 60 minutes. The highest grade is counted BEFORE the due date, and you can review the correct answers after the due date. **There are 10 questions, and thus 10 points, in each quiz. One lowest Reading Quiz score is dropped, so total of Reading Quiz points counted are 100 points. Reading Quizzes are due every other Monday.**

3. Mini Projects

The Mini Projects are designed to strengthen your understanding of lecture materials, and will provide the opportunity to investigate or relate to astronomical phenomena as many ancient cultures once did. Some Mini Projects align with specific astronomical events and thus will **require time-sensitive participation or outdoor observations (see schedule below or on BBLearn)**. Submission of Mini Projects are through Discussion Board or as Assignments on BBLearn, therefore students can share each other's work or results for some interaction online. **There are 7 Mini Projects, and each is 10 points. One lowest Mini Project score is dropped, so the total of Mini Project points counted are 60 points. Mini Projects are due every other Monday (alternating from Reading Quizzes).**

4. BBLearn Exams

Midterm Exam: due Monday, March 8, 11:59pm | Unit 1 to 5, total 70 points

Final Exam: due Monday, April 27, 11:59pm | Unit 6 to 11, total 90 points

The exams are all on BBLearn with multiple choice questions, fill-in-the-blanks, matching, and some short-answer questions. **Both exam will be open for four days, and will be closed at the due date listed above.** Again if you encounter any technical difficulties during your exams, please contact Dr. Chien at Lisa.Chien@nau.edu immediately.

You can choose to do any **Extra Credit Opportunities** (posted on the top of menu bar in BBLearn) to make up the points you missed. There are no limits to how many extra credit points you can earn!

Below is a summary of the Assignments and Assessments:

Category	Due (see detail schedule below)	# of Assignments	Points	Includes:
STEP3 Question	Every Friday	11, 16-17 points each	180	ALL STEP3 Questions + Extra Credits (unlimited), NONE Dropped
Reading Quiz	Every other Monday	11, 10 points each	100	1 Lowest Dropped
Mini Project	Every other Monday	7, 10 points each	60	1 Lowest Dropped
Midterm Exam	Due Monday 3/8	1	70	Unit 1 to 5 Materials
Final Exam	Due Tuesday 4/27	1	90	Unit 6 to 11 Materials

Supplemental Apps

To help you get used to sky viewing, here are some free (lite version), helpful and highly recommended apps/software (NOT required for the class). All these apps/software allow you to point your device to the sky, and displays and identifies objects right on your device!



SkyView— I recommend this one among the two below, since it overlays on what you see through your camera, and you can take a quick picture with labels on the sky!



Night Sky— This app has incredible visualization, and when you pinch or tap on the constellations or any objects, it takes you to a 3D view of the stars in space and shows you more than enough of information you want to know about the object.



Star Chart— It's simple and easy to use (without information overload), and when you tap on objects, it give you nice simple astronomical data about them.



stellarium.org— Stellarium is a free open source planetarium for your computer (which also has a web form: stellarium-web.org/ and a non-free app called Stellarium Mobile PLUS Sky Map). It shows a realistic sky in 3D, just like what you see with the naked eye, binoculars or a telescope.

Respect for Diversity

It is my intent that students from all diverse backgrounds and perspectives be well served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength and benefit. It is my intent to present materials and activities that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course for you personally or for other students or student groups. In addition, if any of our class meetings conflict with your religious events, please let me know so that we can make arrangements for you. I am NAU Safe Zone certified.

Class Tentative Schedule (Please see BBLearn page for most updated version)

Week	Date	Day	Topic		STEP3 Questions DUE	Reading Quiz DUE	Mini Project DUE
			Unit	Section			
1	1/12	T					
	1/14	Th	Unit 1: Connecting With the Sky	1.1			
	1/15	F			-		
2	1/18	M	No Class				
	1/19	T		1.2, 1.3			
	1/21	Th		1.3			
	1/22	F			-		
3	1/25	M				-	#1: Globe at Night
	1/26	T	Unit 2: Cultural History of Indigenous People in North & Central America	2.1			
	1/28	Th		2.2, 2.3			
	1/29	F			Unit 1		
4	2/1	M				Unit 1	-
	2/2	T	Unit 3: Cosmogony and Cosmology in Native & Western Astronomies	3.1			
	2/4	Th		3.2			
	2/5	F			Unit 2		
5	2/8	M				-	#2: Origin or Star Stories
	2/9	T	Unit 4: Celestial Sphere & Sidereal Motion	4.1			
	2/11	Th		4.2			
	2/12	F			Unit 3		
6	2/15	M				Unit 2 & Unit 3	-
	2/16	T		4.3			
	2/18	Th	Unit 5: Sun & the Diurnal Cycle	5.1, 5.2			
	2/19	F			Unit 4		
7	2/22	M				-	#3: NASA Mission Patch
	2/23	T		5.3, 5.4			
	2/25	Th	Unit 6: Seasons & the Annual Cycle	6.1			
	2/26	F			Unit 5		
8	3/1	M				Unit 4 & Unit 5	-
	3/2	T		6.2			
	3/4	Th	Unit 7: Moon & the Lunar Cycle	7.1			
	3/5	F			-		
9	3/8	M	Midterm Exam Due: Unit 1 to Unit 5				
	3/9	T		7.1, 7.2			
	3/11	Th		7.3, 7.4			
	3/12	F			Unit 6		
10	3/15	M				-	#4: Track the Moon
	3/16	T	Unit 8: Stars	8.1			
	3/18	Th		8.2			
	3/19	F			Unit 7		
11	3/22	M				Unit 6 & Unit 7	-
	3/23	T		8.3			
	3/25	Th	Unit 9: Constellations	8.3, 9.1			
	3/26	F			-		
12	3/29	M				-	#5: Spring Equinox with Lowell Observatory
	3/30	T		9.2, 9.3			
	4/1	Th		9.4			
	4/2	F			Unit 8		
13	4/5	M				Unit 8	-
	4/6	T		9.4			
	4/8	Th	Unit 10: Planets	10.1			
	4/9	F			Unit 9		
14	4/12	M				-	#6: Stars & Time
	4/13	T		10.2			
	4/15	Th	Unit 11: Comets, Asteroids & Meteors	11.1			
	4/16	F			Unit 10		
15	4/19	M				Unit 9 & Unit 10	-
	4/20	T		11.2			
	4/22	Th		11.3			
	4/23	F			Unit 11	*Unit 11 (Due Fri)	*#7: Lyrids Meteor Shower (Due Fri)
16	4/27	T	Final Exam Due: Unit 6 to Unit 11				

Academic Deadlines

- ADD/DROP deadline (without “W”): Jan 20
- Last day to file for A-Pass/Fail: Feb 12
- Last day to withdraw: Mar 14

Academic Integrity Policy

Please read this section carefully as each student is required to understand and comply with all Academic Integrity rules and standards. Both NAU and this Department have standards which are written and referenced below.

- Passing other’s work off as your own (plagiarism) and cheating are not accepted at NAU and are absolutely not tolerated in this class. It is not the professor’s responsibility to attempt to describe and prohibit any and all forms of Academic Dishonesty. **It is your responsibility to uphold the highest ethical standards.** If you have any doubt or question about this policy, it is your responsibility to ask the professor in advance and to be clear about the answers and policies.
- If you are caught cheating or if any of your **assignments/exams are found suspiciously similar** (such as exact same wording on written responses— note, changing a few words or the order of certain words is still plagiarism!), **ALL** students involved will receive zero points on that assignment or exam. The bottom line: ***Do your own work and do not let others copy off of you.***
- Academic Dishonesty information will be given to the Dean of Students and a written copy of any such incident may be attached to your official NAU file. If cheating/plagiarism continue, you will receive F in the class and the Dean’s office will be notified. University Academic Integrity Policy can be found [here](#).

University Policies can be found at nau.edu/university-policies/.

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.

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 (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, or veteran status. Due to potentially unethical consequences, 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. EAO also assists with religious accommodations. For additional information about nondiscrimination or anti-harassment 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 visit 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 Elyce C. Morris. 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 928-523-3515, by fax at 928-523-0640, or by email at elyce.morris@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 <https://in.nau.edu/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.

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, 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.

“Education is the most powerful weapon which we can use to change the world.”
— Nelson Mandela