

Department of Astronomy and Planetary Science AST 201: Introduction to Indigenous Astronomy Fall 2020

Meeting Times

- **Asynchronous Learning:** Online Blackboard Learn Course Page
- **Synchronous Classes:** MWF 9:10—10:00 am through Zoom

Zoom Link- <https://nau.zoom.us/j/98911401284?pwd=cmFOYmpOUFc3a0NhSG82akVEMEVwZz09>

Join by smart phone with Zoom App- Meeting ID: **989 1140 1284** Password: **13579**

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) Participation Questions and Reading Quiz for each Unit, 3) Mini Projects to be posted and shared in BBLearn Discussion Boards, and 4) Online Midterm and Final Exams.
- **Synchronous Classes** are designed to follow this flow— *Introduction Monday, Indigenous Wednesday, Astronomy Friday*. Every Monday, a brief introduction and guide for weekly materials, mini projects, and dues, followed by Q&A sessions. Every Wednesday, a brief lesson to enhance and supplement content related to Indigenous People, followed by Group Discussions or Q&A. Every Friday, a brief lesson focusing on Astronomy-related topics, followed by Group 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: Bldg. 19, Rm. 311

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.

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 a **Cultural Understanding** 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 Lectures, participate online assignments, and finish online exams.

Grading System

Assessment	Points	Grade	Total Points You Earned
Participation	180	A	448 — 500 or more
Reading Quiz	100	B	398 — 447
Mini Project	60	C	348 — 397
Midterm Exam	70	D	298 — 347
Final Exam	90	F	0 — 297

Assignments & Assessments

1. Online Participation Questions

In each Section of each Unit, there is a small portion of Participation Questions based on the Mini Lectures. These

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 Sundays, 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**

- **Participation: 2 points off each STEP3 submission**
- **Reading Quiz: 2 points off quiz**
- **Mini Projects: 5 points off each project**
- **Exams: count as 0 points**

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**.

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!

2. Online 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 Sunday**.

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)**. 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 Sunday (alternating from Reading Quizzes).

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.

4. Online Exams

Midterm Exam: due October 4, Sunday, 11:59pm | Unit 1 to 5, total 70 points

Final Exam: due November 23, Monday, 11:59pm | Unit 6 to 11, total 90 points

The exams are all online with multiple choice questions, fill-in-the-blanks, matching, and some short-answer questions. **Midterm exam will be open for three days, Oct 2 to 4, and Final will be open on Nov 19. The exams 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.

Below is a summary of the Assignments and Assessments:

Category	Due (see detail schedule below)	# of Assignments	Points	Includes:
Participation	Every Friday	11, 16-17 points each	180	ALL STEP3 Questions + Extra Credits (unlimited), NONE Dropped
Reading Quiz	Every other Sunday	11, 10 points each	100	1 Lowest Dropped
Mini Project	Every other Sunday	7, 10 points each	60	1 Lowest Dropped
Midterm Exam	Due Sunday 10/4	1	70	Unit 1 to 5 Materials
Final Exam	Due Monday 11/23	1	90	Unit 6 to 11 Materials

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.

COVID-19 REQUIREMENTS AND INFORMATION

The following statements in red 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 to actively participate in their coursework during the required day and time of a course, even 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.

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

Week	Date	Day	Topic	Participation Due	Reading Quiz Due	Mini Project Due	
1	8/12	W	Introduction				
	8/14	F	Unit 1	1.1			
2	8/17	M		1.2			
	8/19	W		1.3			
	8/21	F		1.3			
3	8/24	M	Unit 2	2.1			
	8/26	W		2.1			
	8/28	F		2.2	Unit 1		
	8/30	Sun		-		#1: Globe at Night	
4	8/31	M		2.3			
	9/2	W	Unit 3	3.1			
	9/4	F		3.1	Unit 2		
	9/6	Sun		-	Unit 1 & Unit 2		
5	9/7	M	No Class				
	9/9	W		3.2			
	9/11	F	Unit 4	4.1	Unit 3		
	9/13	Sun		-		#2: Origin Stories	
6	9/14	M		4.2			
	9/16	W		4.3			
	9/18	F	Unit 5	5.1	Unit 4		
	9/20	Sun		-	Unit 3 & Unit 4		
7	9/21	M		5.2			
	9/23	W		5.3			
	9/25	F		5.4	Unit 5		
	9/27	Sun		-		#3: Fall Equinox	
8	9/28	M	Unit 6	6.1			
	9/30	W		6.2			
	10/2	F	Unit 7	7.1	-	Unit 5 (Due Fri)	
	10/4	Sun	Midterm Exam Due: Unit 1 to Unit 5				
9	10/5	M		7.1			
	10/7	W		7.2			
	10/9	F		7.3	Unit 6		
	10/11	Sun		-		#4: NASA Mission Patch	
10	10/12	M		7.4			
	10/14	W	Unit 8	8.1			
	10/16	F		8.2	Unit 7		
	10/18	Sun		-	Unit 6 & Unit 7		
11	10/19	M		8.3			
	10/21	W		8.3			
	10/23	F	Unit 9	9.1	-		
	10/15	Sun		-		#5: Track the Moon	
12	10/26	M		9.2			
	10/28	W		9.3			
	10/30	F		9.4	Unit 8		
	11/1	Sun		-	Unit 8		
13	11/2	M		9.4			
	11/4	W	Unit 10	10.1			
	11/6	F		10.1	Unit 9		
	11/8	Sun		-		#6: Stars & Time	
14	11/9	M		10.2			
	11/11	W	No Class				
	11/13	F	Unit 11	11.1	Unit 10		
	11/15	Sun		-	Unit 9 & Unit 10		
15	11/16	M		11.2			
	11/18	W		11.3	Unit 11		
	11/19	Th		-	Unit 11 (Due Thur)	Extra: Meteor Shower	
16	11/23	M	Final Exam Due: Unit 6 to Unit 11				

Academic Deadlines

- ADD/DROP deadline (without “W”): August 21
- WITHDRAWAL deadline without petition: October 19

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/.

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.

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