

## Introduction to Indigenous Astronomy

### General Information

- CEFNS Department of Physics and Astronomy
- AST 201- 5805 (Intro to Indigenous Astronomy) – Section 1
- Semester: Fall 2019
- Meeting Time: WeFr 4:00-5:15 pm (3 Credit Hours)
- Location: Physical Sciences Bldg 19, rm. 233
- Instructor: Dr. David Koerner
- E-mail: david “dot” koerner “at” nau “dot” edu [Note: Instructor does not use the mail feature on BbLearn]
- Office address: Physical Sciences Bldg 19, rm. 319
- Office hours: WF 1:00-2:30 or by appointment
- Office Phone: 928-523-4562

### Course Prerequisites:

None

### Course Description:

This is a course in comparative astronomy, as seen through the eyes of indigenous peoples and western astronomers. The course will provide an introduction to ancient and living astronomies of native peoples and a comparison with modern astronomy and planetary science. It will examine how indigenous cultures reference the skies and how they integrate humans into the cosmos. It will examine the importance of worldview and how it affects a person’s perception of the universe. It will focus on observation-based astronomy and the use of technology in the study of indigenous astronomy, and will 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.

**Thematic Focus:** The thematic focus of the course is *Valuing the Diversity of Human Experience*, since it will be examining the astronomies of different indigenous cultures. In addition the course will touch on *Environmental Consciousness*, as indigenous astronomies interconnect earth and sky, and on *Technology and its Impact* as we explore the use of technology in the past and present day study of astronomy.

**Distribution Block:** The course is designed to advance *Cultural Understanding* through a comparison of ancient and living astronomies of native peoples with western astronomy and modern advances in space science exploration, and of the cultural ethics of traditional native astronomy with those of modern space science.

Essential skills: 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*.

### Course Objectives and Learning Outcomes:

- Students will be able to describe the role of diverse cultures in understanding the relationship of man to the universe in which we live.
- Students will be able to 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.
- Students will be able to 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.
- Students will learn how ancient and modern indigenous cultures often practiced observational astronomy in ways that resemble scientific practice.

### Course structure/approach

This course will blend online modes of learning with lecture and in-class activities. Online assessment of assigned readings will engage students to focus on course material. Lecture reviews of the material will aid comprehension. Exercises are in the form of clicker response activities help students to achieve final learning outcomes and succeed at exams. Sky Watch assignments will be structured to help students directly observe astronomical phenomena as witnessed by indigenous cultures.

### Textbook and required materials

Weekly readings will be uploaded onto BbLearn. No textbook purchase is necessary.

**iClicker2 Student Response Pad Registration** We will make use of clickers to facilitate peer interaction during each lecture class. **YOU MUST HAVE A REGISTERED CLICKER TO EARN PARTICIPATION CREDIT.** Instructions and a link for registering are on the class BbLearn site.

### Assessment Methods for Student Learning Outcomes

- Regular attendance is required and will count for 10% of the course grade. Attendance will be monitored by a clicker participation grade
- Weekly online quizzes in BbLearn will cover the assigned readings. Quizzes are open-book and allow plenty of time for students to re-read chapter material to provide a thoughtful answer to questions. Quiz grades will account for 30% of the over-all grade and must be completed by the deadline. No Quiz makeups will be given, but the lowest quiz score will be dropped.
- Sky Watch homework Assignments will compose 30% of the course grade. These will require scheduled observations outside of class time.

- Three exams will be assigned and will build upon quiz and homework material. Format may include multiple choice questions, single-answer and short essay questions, and quantitative calculations. Combined mid-term exams count for 30% of the course grade (10% for each exam). No midterm makeups will be given. If you have a medical excuse, your final exam score will be substituted for the score of the midterm for which you have an excuse.

**Midterm Course Grade Calculation in LOUIE:** Midterm grades for LOUIE will be computed as follows: Midterm 1: 30%, SkyWatch Assignments: 30%, Quizzes: 30%, Class Attendance: 10%  
**Final Grade:** Attendance: 10%, Online Quizzes: 30%, SkyWatch Assignments: 30%, Exams 30%

### Course Schedule of Topics (approximate)

Note: **This schedule is approximate – Do NOT plan absences around tentatively scheduled exam dates! You are required to attend all classes and will not be accommodated for being absent on an exam date that differs from the tentative plan below without a medical excuse!**

Week 1 (8/28-8/30) – Cultural Astronomy  
 Week 2 (9/4-9/6) – Father Sky  
 Week 3 (9/11-9/13) – Mother Earth  
 Week 4 (9/18-9/20) – Indigenous People of the New World  
 Week 5 (9/25-9/27) – Sun and Diurnal Cycle – Weekend Star Parties at Buffalo Park  
 Week 6 (10/2-10/4) – **Midterm 1**; Seasons, and the Annual Cycle  
 Week 7 (10/9-10/11) – Annual Cycle & Moon  
 Week 8 (10/16-10/18) – Lunar Cycle and Planets  
 Week 9 (10/23-10/25) – Comets, Meteors, Aurora  
 Week 10 (10/30–11/1) – Mayan Astronomy and Calendar  
 Week 11 (11/6-11/8) – **Midterm 2**; Stars and Constellations  
 Week 12 (11/13-11/15) – Stars and Constellations  
 Week 13 (11/20-22) – Milky Way, Galaxies and Cosmology  
 Week 14 (11/27-11/29) **Thanksgiving Vacation**  
 Week 15 (12/4-12/6) - Life in the Universe (End of Term Week)  
 Week 16 (Finals Week - 12/9) – **Exam 3**; Exact Date/time TBD

**Excused Absences:** Students who receive excused absences are expected to review class materials for days missed. One lowest quiz grade will be dropped, but make-up quizzes will not be given.

### Resources for Student Success

[ResourceConnect](http://nau.edu/university-college/student-resources/resource-connect/)- <http://nau.edu/university-college/student-resources/resource-connect/>  
 this is your online central navigation point for all NAU student resources

University and Course policies displayed and linked at:  
<http://www.physics.nau.edu/SYLLABI/POLICY/policy.html>