



PTYS170B2 Universe and Humanity

Kuiper Space Sciences Room 308, Tue 09:30-10:45, Thu 09:30-10:45

Description of Course

This course places the Earth and humanity in a cosmic context and seeks to answer fundamental questions about our surroundings. Where are we and where do we, the Earth and the Solar System come from? What are the planets in the solar system like and are there other planetary systems like ours? What is matter made of and how is it produced in the Universe? What are the different types of stars out there and how does the Sun fit in? What is the role of stars in shaping planetary systems and the cosmos? In addition to addressing these questions, this course will help you to understand how we have arrived at our current understanding of planets, stars and the Universe, illuminating the scientific method and the influence of scientific enquiry on the society.

Instructor and Contact Information

Tommi Koskinen, Kuiper Space Sciences (KSS) 421, 520-6216939, tommi@lpl.arizona.edu

Office Hours: 2-3pm Tuesday and Thursday, or by appointment

<https://www.lpl.arizona.edu/faculty/tommi-koskinen>

Graduate Teaching Assistants

Indujaa Ganesh, indujaa@lpl.arizona.edu

Office Hours: 2.30-4.30pm Thursday (KSS 330)

Amanda Stadermann, acs@lpl.arizona.edu

Office Hours: 2-3pm Monday and Wednesday (KSS 318)

Course Format and Teaching Methods

Lectures, individual and small group activities, term project, homework sheets, mid-term and final quizzes, web-delivered content and assessment

Course Objectives and Expected Learning Outcomes

The students will develop an understanding of the importance of physical and chemical processes that control our surroundings. For example, they will acquire a qualitative understanding of the history of solar system science, the Copernican revolution, Newton's laws and gravity, the properties of light and matter, the planets in the solar system, the Sun, other planetary systems in the galaxy, the origin of stars and planetary systems and Earth as a habitable planet. The students will be exposed to a variety of topics in astronomy and planetary science and will develop a basic understanding of the scientific method. The students are expected to answer questions about and describe these topics in their own words during lectures, in homework assignments, term project notes and quizzes. The course follows the writing requirement for General Education classes and supports basic mathematical literacy by requiring students to undertake simple calculations. More information on Natural Sciences (NATS) course outline can be obtained from: <https://gened.arizona.edu/content/tier-one-outcomes#Nats>. General information on undergraduate program assessment is available at http://assessment.arizona.edu/academic_degree_programs.

Absence and Class Participation Policy

The UA's policy concerning Class Attendance, Participation, and Administrative Drops is available at: <http://catalog.arizona.edu/policy/class-attendance-participation-and-administrative-drop>

The UA policy regarding absences for any sincerely held religious belief, observance or practice will be accommodated where reasonable, <http://policy.arizona.edu/human-resources/religious-accommodation-policy>.

Absences pre-approved by the UA Dean of Students (or Dean Designee) will be honored. See: <https://deanofstudents.arizona.edu/absences>

Participating in the course and attending lectures and other course events are vital to the learning process. As such, attendance is strongly recommended.

Course Communications

Online communication will be conducted through D2L.

Recommended Textbook

The Cosmic Perspective (Bennett, Donahue, Schneider, Voit). The textbook is not required but strongly recommended.

Required or Special Materials

Clickers and simple calculators are required.

Required Extracurricular Activities

The course includes an optional term project that is undertaken outside of class. The students are required to construct simple equipment to measure the solar zenith angle at different times and record their measurements during the term. More information about the term project is available through the course D2L page.

Assignments and Examinations: Schedule/Due Dates

There are eight homework sheets, assigned roughly every other week, three mid-term quizzes and a final quiz (for those who choose not to do the term project). The current schedule of due dates for homework is:

- #1: August 31
- #2: September 14
- #3: September 28
- #4: October 12
- #5: October 19
- #6: November 2
- #7: November 16
- #8: November 30

Updates to the schedule will be communicated in class and posted on D2L. The current schedule of quizzes is:

- #1: September 18
- #2: October 25
- #3: December 4

Final: December 12, 8-10am

Term Project and Final Examination

The term project is due on Friday, November 16. Please submit the materials through D2L. The final quiz is scheduled for Tuesday, December 12, 8-10am. Final Exam Regulations can be found at <https://www.registrar.arizona.edu/courses/final-examination-regulations-and-information>, and Final Exam Schedule is at <http://www.registrar.arizona.edu/schedules/finals.htm>

Grading Scale and Policies

Homework sheets: 30%

Mid-term quizzes: 40%

Final quiz: 0-20%

In-Class work: 10%

Term project: 0-20%

A: 90-100

B: 80-89.9

C: 65-79.9

D: 50-64.9

E: <50

The students will choose if they want to sign up for the term project. If they do, it will count up to 20% of their overall grade and they do not have to take the final quiz. If not, the final quiz counts up to 20% of the overall grade. There will be opportunities for extra credit that will be announced during the term.

The general university policy regarding grades and grading systems is available at <http://catalog.arizona.edu/policy/grades-and-grading-system>

Requests for incomplete (I) or withdrawal (W) must be made in accordance with University policies, which are available at <http://catalog.arizona.edu/policy/grades-and-grading-system#incomplete> and <http://catalog.arizona.edu/policy/grades-and-grading-system#Withdrawal> respectively.

Dispute of Grade Policy: Disputes over grades must be made to the instructor within a reasonable time of receiving the marked assignment.

Honors Credit

Students wishing to contract this course for Honors Credit should email me to set up an appointment to discuss the terms of the contract. Information on Honors Contracts can be found at <https://www.honors.arizona.edu/honors-contracts>.

Scheduled Topics/Activities

The preliminary class schedule is as follows:

Week 1: The Earth and the Cosmos

Week 2: Apparent motion of celestial bodies

Week 3: Models of the solar system

Week 4: Force and energy, light and spectra

Week 5: Quiz #1, Guest lectures

Week 6: Structure of matter, comparative planetology
Week 7: Rocky planets of the solar system
Week 8: The Earth, asteroids, meteorites, dwarf planets and comets
Week 9: The outer solar system
Week 10: The Sun, Quiz #2
Week 11: Life cycle of stars
Week 12: Alien worlds (exoplanets)
Week 13: Formation and age of planetary systems
Week 14: Earth and habitability
Week 15: Cosmology (TBD)
Week 16: Quiz #3
Final quiz: December 12

Classroom Behavior Policy

To foster a positive learning environment, students and instructors have a shared responsibility. We want a safe, welcoming, and inclusive environment where all of us feel comfortable with each other and where we can challenge ourselves to succeed. To that end, our focus is on the tasks at hand and not on extraneous activities (e.g., texting, chatting, reading a newspaper, making phone calls, web surfing, etc.).

Students are asked to refrain from disruptive conversations with people sitting around them during lecture. Students observed engaging in disruptive activity will be asked to cease this behavior. Those who continue to disrupt the class will be asked to leave lecture or discussion and may be reported to the Dean of Students.

The use of laptops, iPads, and other such mobile devices is not permitted in class for any other purposes other than those directly related to the course (in-class activity or note taking).

Posting videos, photos or recordings of lectures online or distributed by any other media format is strictly prohibited (this includes social media forums). You may only make recordings for personal use with a written permission from the instructor.

Materials available through D2L must not be distributed in public without permission due to possible conflict with copyright rules.

Threatening Behavior Policy

The UA Threatening Behavior by Students Policy prohibits threats of physical harm to any member of the University community, including to oneself. See

<http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students>.

Accessibility and Accommodations

Our goal in this classroom is that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, please let me know immediately so that we can discuss options. You are also welcome to contact the Disability Resource Center (520-621-3268) to establish reasonable accommodations. For additional information on the Disability Resource Center and reasonable accommodations, please visit <http://drc.arizona.edu>.

If you have reasonable accommodations, please plan to meet with me by appointment or during office hours to discuss accommodations and how my course requirements and activities may impact your ability to fully participate.

Please be aware that the accessible table and chairs in this room should remain available for students who find that standard classroom seating is not usable.

Code of Academic Integrity

Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, graded work/exercises must be the product of independent effort unless otherwise instructed. Students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog. See:

<http://deanofstudents.arizona.edu/academic-integrity/students/academic-integrity>.

The University Libraries have some excellent tips for avoiding plagiarism, available at <http://new.library.arizona.edu/research/citing/plagiarism>.

Selling class notes and/or other course materials to other students or to a third party for resale is not permitted without the instructor's express written consent. Violations to this and other course rules are subject to the Code of Academic Integrity and may result in course sanctions. Additionally, students who use D2L or UA e-mail to sell or buy these copyrighted materials are subject to Code of Conduct Violations for misuse of student e-mail addresses. This conduct may also constitute copyright infringement.

UA Nondiscrimination and Anti-Harassment Policy

The University is committed to creating and maintaining an environment free of discrimination; see <http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy>

Additional Resources for Students

UA Academic policies and procedures are available at <http://catalog.arizona.edu/policies>

Student Assistance and Advocacy information is available at

<http://deanofstudents.arizona.edu/student-assistance/students/student-assistance>

Subject to Change Statement

Information contained in the course syllabus, other than the grade and absence policy, may be subject to change with advance notice, as deemed appropriate by the instructor.