PTYS170B2 Universe and Humanity

Tier 1 Natural Sciences/NATS 102

Kuiper Space Sciences Room 308 and online, Tue 12:30-1:45pm, Thu 12:30-1:45pm

This class is scheduled to be taught in the Flex In-Person modality (see Course Format and Teaching Methods below).

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 inquiry on the society.

Instructor and Contact Information

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

Office Hours: On Zoom by appointment at 2-4pm Tuesday and Thursday

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

Graduate Teaching Assistants

Patrick O'Brien, pob@lpl.arizona.edu

Office Hours: XXX

Laura Seifert, lseifert@email.arizona.edu

Office Hours: XXX

Course Format and Teaching Methods

Lectures, individual and small group activities, term projects, homework assignments, mid-term quizzes, web-delivered content and assessment

We will be meeting remotely at least until the University notifies us that in-person meetings can commence. We will meet on Tuesday 12.30-1.45pm and Thursday 12.30-1.45pm on Zoom for regular lectures and other activities. We will use D2L for all class communications and student should use D2L to enter the Zoom meetings. D2L quizzes will replace in-person quizzes for this course.

When the Covid-19 situation permits teaching on campus, in-person classes will be made available. Students who wish to come to class in person will register in advance on D2L at the beginning of each week. In-person classes take place in Kuiper Space Science room 308 and will be streamed live on Zoom. Should the number of students wishing to come to class exceed the capacity of the lecture hall (which is reduced to enable social distancing), the instructor will rotate students to enable all those who wish to attend class in person to be able to do so at least periodically.

After the Thanksgiving holiday, we are scheduled to move back to remote only teaching.

Course Objectives

During this course, the students will be exposed to a variety of topics in astronomy and planetary science, including the history of planetary science and astronomy, the Copernican revolution, Newton's laws and gravity, relativity, 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. Students are expected to answer questions about and describe these topics during lectures, in homework assignments, term project 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://catalog.arizona.edu/policy/general-education-tier-one-and-tier-two. General information on undergraduate program assessment is available at http://assessment.arizona.edu/academic_degree_programs.

Learning Outcomes

The students will develop an understanding of the importance of physical and chemical processes that shape our surroundings and apply it to the study of astronomy and planetary sciences. The students will learn the fundamental concepts and major current topics in these fields and understand the place of the Earth and humanity in the cosmic context. They will gain a solid foundation in these topics to facilitate further study or interest. They will learn to apply their knowledge to write about astronomy and planetary science in their own words. They will also learn the basis of the scientific method and have an opportunity to apply it in practice to interpret observational data and design experiments.

Absence and Class Participation Policy

The UA's policy concerning Class Attendance, Participation, and Administrative Drops is available at: https://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: http://policy.arizona.edu/employmenthuman-resources/attendance

Participating in the course and attending lectures and other course events, either in person (when available) or online via Zoom, are vital to the learning process.

If you feel sick, or may have been in contact with someone who is infectious, stay home. Except for seeking medical care, avoid contact with others and do not travel. Notify your instructors of you will be missing an in person or online course. Campus Health (https://health.arizona.edu) is testing for COVID-19. Please call (520) 621-9202 before you visit in person. Visit the UArizona COVID-19 page (https://covid19.arizona.edu) for regular updates.

Face coverings and social distancing

Per UArizona's **Administrative Directive**, face coverings that cover the nose, mouth, and chin are required to be worn in all learning spaces at the University of Arizona (e.g., in classrooms, laboratories and studios). Any student who violates this directive will be asked to immediately leave the learning space, and will be allowed to return only when they are wearing a face covering.

Subsequent episodes of noncompliance will result in a Student Code of Conduct complaint being filed with the Dean of Students Office, which may result in sanctions being applied. The student will not be able to return to the learning space until the matter is resolved. During our in-person class meetings, we will respect CDC guidelines, including restricted seating to increase physical distancing.

The Disability Resource Center is available to explore face coverings and accessibility considerations if you believe that your disability or medical condition precludes you from utilizing any face covering or mask option. DRC will explore the range of potential options as well as remote course offerings. Should DRC determine an accommodation to this directive is reasonable, DRC will communicate this accommodation with your instructor.

Course Communications

Online communication will be conducted through D2L.

Recommended Textbook

The Cosmic Perspective (Bennett, Donahue, Schneider, Voit). The textbook is provided through Inclusive Access on D2L and it is strongly recommended that students opt in.

Required Extracurricular Activities

The course includes a term project that is undertaken outside of class. Students are required to choose one project out of the available options early in the semester. More information about choosing the term project is available through the course D2L page.

Assignments and Examinations: Schedule/Due Dates

There are five homework assignments, three mid-term quizzes on D2L and a term project that replaces the final quiz for this semester. The current schedule of due dates for homework is:

#1P: September 6

#1: September 20

#2: October 4

#3: October 18

#4: November 8

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

#1: September 24

#2: October 29

#3: December 3

Writing requirement

All Tier One and Tier Two General Education Courses are writing intensive. Writing assignments are incorporated into the course through homework assignments, in-class exercises and term projects.

Final project

The term project acts as the final examination for this course. The final project submissions are due on Friday, November 22. 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. The schedule is provided for reference only. There is no final exam on this course.

Grading Scale and Policies

Homework sheets: 30%

Mid-term quizzes: 40%

Term project: 20%

Group assignments: 10%

A: 90-100

B: 80-89.9

C: 65-79.9

D: 50-64.9

E: <50

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/course-policies.

Scheduled Topics/Activities

The anticipated class schedule is as follows:

Week 1: The Earth and the Cosmos
Week 2: Apparent motion of celestial bodies
Week 3: Copernican revolution and Newton's laws
Week 4: Light and matter
Week 5: Quiz#1
Week 6: Relativity
Week 7: The sun and stars
Week 8: Cosmology and planet formation
Week 9: Rocky planets in the solar system
Week 10: Quiz#2
Week 11: Rocky planets in the solar system
Week 12: Giant planets and the outer solar system
Week 13: Extrasolar planets
Week 14: Habitable worlds
Week 15: Quiz#3
Week 16: Extrasolar planets

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 distributing them by any other media format is strictly prohibited (this includes social media forums). Materials available through D2L must not be distributed in public without explicit permission. All recordings are subject to government and university regulations. Therefore, students accessing unauthorized recordings or using them in a manner inconsistent with UArizona values and educational policies are subject to suspension and civil action.

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 the lecture 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.