PTYS170B2 Universe and Humanity

Tier 1 Natural Sciences/NATS 102
Kuiper Space Sciences Room 308, Tue/Thu 12:30-1:45pm

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? What are the different types of stars out there and how does the Sun compare with them? 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, 520-621-6939, tommik@arizona.edu
Office Hours: 2-3pm Tuesday and Thursday, or by appointment
https://www.lpl.arizona.edu/faculty/tommi-koskinen

Graduate Teaching Assistants
Weigang Liang, wl463@email.arizona.edu
Office Hours: TBD
Patrick O’Brien, pob@lpl.arizona.edu
Office Hours: TBD

Course Format and Teaching Methods
Lectures, individual and small group activities, term project, homework assignments, mid-term, and final quiz

Course Objectives
During the course, the students will be exposed to key topics in astronomy and planetary science, including the history of astronomy, the Copernican revolution, Newton’s laws and gravity, relativity, the properties of light and matter, the sun and planets in the solar system, extrasolar planets, 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 includes quantitative reasoning. More information on Natural Sciences (NATS) course outline can be obtained from: https://catalog.arizona.edu/policy/general-education-tier-one-and-tier-two.
**Learning Outcomes**
This course aims to provide a qualitative foundation in astronomy and planetary science to facilitate further study or interest. The students will develop an understanding of the basic physical and chemical processes that shape our surroundings and learn to apply this knowledge to the study of astronomy and planetary science. They will be able to explain the fundamental concepts and major current topics in these fields, and describe the place of the Earth and humanity in the cosmic context. They will be able to demonstrate their knowledge by writing about topics in astronomy and planetary science in their own words. They will also learn the basis of the scientific method and will be able to apply it 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](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](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](http://policy.arizona.edu/employmenthuman-resources/attendance)

Participating and attending lectures and other course events are vital to the learning process. The lectures cover material that is not included in the textbook and include in-class assignments and clicker questions.

**Classroom attendance during the COVID-19 pandemic**
As we enter the Spring semester, the health and wellbeing of everyone in this class is the highest priority. Accordingly, we are all required to follow the university guidelines on COVID-19 mitigation. Please visit the [UArizona COVID-19 page](https://www.arizona.edu/covid-19) for the latest guidance.

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 instructor(s) if you will be missing a course meeting or an assignment deadline. Non-attendance for any reason does not guarantee an automatic extension or due date or rescheduling of examinations/assessments. Please communicate and coordinate any request directly with your instructor.

If you must miss the equivalent of more than a week of class, you should contact the Dean of Students Office [DOS-deanofstudents@email.arizona.edu](mailto:DOS-deanofstudents@email.arizona.edu) to share documentation about the challenges that you are facing.

Voluntary, free, and convenient [COVID-19 testing](https://www.arizona.edu/covid-19/testing) is available for students on Main Campus. COVID-19 vaccine is available for all students at [Campus Health](https://www.arizona.edu/health).

**Course Communications**
Online communication will be conducted through D2L.

**Recommended Textbook**
The Cosmic Perspective (Bennett, Donahue, Schneider, Voit)

**Required Materials**
Clickers are required.
Required Extracurricular Activities
The course includes an optional term project that is undertaken outside of class. More information about the term project is available through the course D2L page.

Assignments and Examinations: Schedule/Due Dates
There are six homework assignments, 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:

- #1P: January 23
- #1: February 6
- #2: February 20
- #3: March 6
- #4: April 3
- #5: April 24 (essay)

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

- #1: February 10
- #2: March 24
- #3: April 28

Finals week: May 6-12

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 essays.

Term project and final examination
The final report for the term project is due on Sunday, April 24. Please submit the materials through D2L. The final quiz is scheduled for the week of 05/06-05/12. 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. Note that you are not expected to take the final quiz if you submit the term project report.

Grading Scale and Policies
Homework sheets: 30%
Mid-term quizzes: 40%
Final quiz: 0-20%
Term project: 0-20%
In-class 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 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 take the final quiz. If not, the final quiz counts up to 20% of the overall grade.

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.

**Honors Credit**

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

**Scheduled Topics/Activities**

The anticipated class schedule is as follows:

- Week 1: The Earth and the Cosmos
- Week 2: Solar and lunar cycles
- Week 3: Copernican revolution
- Week 4: Newton’s laws and gravity
- Week 5: Quiz#1
- Week 6: Light and matter
- Week 7: The sun and stars
- Week 8: A brief history of the Universe
- Week 9: Spring break
- Week 10: Star and planet formation
- Week 11: Quiz#2
- Week 12: Rocky planets in the solar system
- Week 13: Rocky planets in the solar system
- Week 14: The outer solar system
- Week 15: Extrasolar planets
- Week 16: Quiz#3
- Week 16: Habitable 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).

Class recordings

For lecture recordings, which are used at the discretion of the instructor, students must access content in D2L only. Students may not modify content or re-use content for any purpose other than personal educational reasons. 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 (Code of Academic Integrity and the Student Code of Conduct) are also subject to civil action. Other materials available through D2L must not be distributed in public without explicit permission.

Academic advising

If you have questions about your academic progress this semester, please reach out to your academic advisor (https://advising.arizona.edu/advisors/major). Contact the Advising Resource Center (https://advising.arizona.edu/) for all general advising questions and referral assistance. Call 520-626-8667 or email to advising@arizona.edu

Life challenges

If you are experiencing unexpected barriers to your success in your courses, please note the Dean of Students Office is a central support resource for all students and may be helpful. The Dean of Students Office can be reached at (520) 621-2057 or DOS-deanofstudents@email.arizona.edu.

Physical and mental health challenges

If you are facing physical or mental health challenges this semester, please note that Campus Health provides quality medical and mental health care. For medical appointments, call (520) 621-9202. For After Hours care, call (520) 570-7898. For the Counseling & Psych Services (CAPS) 24/7 hotline, call (520) 621-3334.

University-wide policies link

Links to the following UA policies are provided here, https://academicaffairs.arizona.edu/syllabus-policies:

- Threatening Behavior Policy
- Accessibility and Accommodation Policy
- Code of Academic Integrity
- Nondiscrimination and Anti-Harassment Policy
- Subject to Change Statement