

## Syllabus

### Course Information

Course name: Astronomy  
Discovery  
Course number: PTYS 495B  
Course credit: 3.0 units  
D2L course website

### Class Information

Lab Days: Tuesday or Thursday  
Lab Time: 9:00-11:50am  
Lab Building: [Flandrau Science Center](#)  
Lab Room: Room 301

### Instructor

Sukrit Ranjan (he/him)  
Email: [sukrit@arizona.edu](mailto:sukrit@arizona.edu)  
Office: Kuiper 428  
Office Hours: By appointment

### Flandrau Science Center Staff

Heather Parra (she/her)	Shiloe Fontes (she/her)
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Office: Flandrau, Rm 212	Office: Flandrau, Rm 204
Office Hours: By appointment	Office Hours: By appointment

### Course Description

**Astronomy Discovery** offers students a unique chance to develop science communication skills while engaging in astronomy education and outreach. Participants will explore research and materials related to astronomy outreach and gain hands-on experience leading activities, troubleshooting, and simplifying complex topics for a 3rd to 6th grade audience. By the end of the semester, students will not only evaluate the effectiveness of existing outreach methods but also create their own engaging activities.

### Learning Outcomes

By the end of the course, students should be able to:

- **Develop Science Communication Skills**  
Students will be able to effectively communicate complex astronomy concepts in a manner appropriate for 3rd to 6th grade students.
- **Lead Astronomy Outreach Activities**  
Students will gain experience in organizing and leading astronomy-focused educational stations or activities for a young audience.
- **Troubleshoot and Problem-Solve in Real-Time**  
Students will develop skills in identifying and addressing challenges that arise during outreach events or educational activities.
- **Evaluate Outreach Effectiveness**  
Students will be able to assess the impact and effectiveness of the outreach methods and protocols they use, ensuring they engage and educate their audience.
- **Design Custom Outreach Activities**  
By the end of the course, students will be able to create and implement their own original astronomy outreach activity, tailored for a specific educational level.

- **Apply** communication skills to education and outreach for elementary school children.

### Course Text and Materials

There is no required text for this course. Relevant readings, videos, and other materials will be provided on the course D2L website.

### Course Components

- Weeks 1-4  
Class will comprise learning the basics of astronomy, hands on learning, and how to successfully run each of the stations.
- Weeks 5-13  
Class will comprise running workshops for schools. If there is no workshop, alternate material may be assigned.
- Weeks 14-16  
Workshops are completed; class will be comprised of the creation of your final projects as well as presenting them to the class.

### Class workshops – 60 Points

Each week, students are required to participate in class workshops at the Flandrau Science Center. Specifically, you will deliver the Astronomy Discovery outreach program to elementary school children. During this program, children will participate in five outreach stations that highlight interesting aspects of Astronomy, with a focus on exoplanets (planets orbiting other stars). In weeks 1-4 of the semester, you will receive training on each of the five outreach stations, as well as a tour and overview of the Flandrau Science Center. In weeks 5-13, you will deliver one of the outreach stations to elementary school children. There will be no lab workshops for this course in weeks 14-16 of the semester.

You will attend at least one workshop each week. Specific workshop days will vary each week depending on the number of elementary schools that have signed-up for the program, and the number of undergraduate students available to deliver the workshops. **The schools that register for Astronomy Discovery and the children who attend the workshops depend on you!** For many children, it is their only field trip of the year, and we are responsible for creating the best possible experience. It is essential that you attend the lab workshop that you have signed up for.

If you cannot attend your workshop, please contact the instructor, the TA, or the preceptor as soon as possible. You will be required to attend an alternate workshop to make up for your absence. You may also attend additional lab workshops each week to further enhance the development of your outreach and education skills.

### Weekly Reflection – 8 Points

Each week, you will post a reflection on our D2L forum on the training and implementation of the workshop, as well as the station effectiveness. This will be relevant in creating the final project.

### Final Project – 32 Points

Working in groups of 3 to 4, students will reflect on the efficacy of the stations presented, the assigned readings, and their own experience to develop and test a hands-on, inquiry-based science activity to teach a relevant astronomical concept to the visiting school children. The new activity will be vetted during the final weeks of class for potential implementation in future programming.

### Grading Policy

The course is worth 100 points total.

- Workshop participation	= 60
- End of semester reflection	= 8
- Final project	= 32
<b>TOTAL</b>	<b>= 100</b>

Letter grades then follow:

A:	≥ 90 pts
B:	≥ 80 pts and < 90 pts
C:	≥ 70 pts and < 80 pts
D:	≥ 60 pts and < 70 pts
F:	< 60 pts

All assignments must be submitted by the stated due date. Late work will not be accepted. All students get one (1) no-questions-asked 2-week extension, which can be applied to any assessment item up until the last day of class (in other words, the extension cannot extend the due date past the last day of class).

### Course Tools

Several digital tools will be used in this course. The **D2L course website** is the primary source for all course information, including the syllabus, course policies, announcements, prework content, prework activities, course surveys, and links to relevant external information. Tutorials and help topics for D2L are available at <https://help.d2l.arizona.edu/student/student-home>. While D2L will be used for course announcements, **Email** will be used for last-minute announcements and individual communication between the instructor and students. Students should check their University of Arizona email account daily, as needed. Students who may need to attend class virtually should contact the instructor as soon as possible.

### Attendance and Make-up Policy

Given the interactive and collaborative nature of this course, it is important that students attend all class sessions and complete the required prework, assignments and other activities. If a student anticipates being absent, is unexpectedly absent, or is unable to participate in class activities, the student should contact the instructor as soon as possible to discuss make-up opportunities. To request a disability-related accommodation for attendance, please contact the Disability Resource Center at [drcinfo@email.arizona.edu](mailto:drcinfo@email.arizona.edu) or (520) 621-3268.

### Communicable Illness (inc. COVID-19)

For current guidance on COVID-19, please visit <https://covid19.arizona.edu/>. Please pay attention to signage on doors and corridors regarding the latest information about campus policies for COVID-19 prevention. If a student feels sick or may have been in contact with someone who is infectious, please stay home from class. Except for seeking medical care, avoid contact with others and do not travel. If appropriate, students can join class sessions remotely via Zoom, and can complete all assignments and activities remotely.

### Artificial Intelligence Policy

Assignments and activities in this course aim to promote individual learning, discussion, creativity, and reflection. As such, all uses of generative artificial intelligence (AI) and/or large language model tools such as ChatGPT, Dall-e, Google Bard, and Microsoft Bing are prohibited. Using these tools will be considered a violation

of the Code of Academic Integrity, specifically the prohibition against submitting work that is not your own. This applies to all assessments and activities, including the end-of-semester reflection and the final project.

### University Policies and Other Information

This course adheres to many University-wide policies, including those for absence and class participation, academic integrity, accessibility and accommodations, nondiscrimination and anti-harassment, and threatening behavior. Syllabus-specific policies are available at <https://academicaffairs.arizona.edu/syllabus-policies>. All academic policies and procedures are available at <http://catalog.arizona.edu/policies>.

#### *Campus and Classroom Safety*

The University of Arizona's Critical Incident Response Team (CIRT) has comprehensive guidance for several emergency situations. This information can be found at <https://cirt.arizona.edu/>. Additionally, students should familiarize themselves with the Evacuation and Active Shooter plans for Flandrau Science Center & Planetarium.

#### *Additional Resources for Students*

**Campus Health** provides quality medical and mental health care services through virtual and in-person care.

Website: <http://www.health.arizona.edu/>

Phone: (520) 621-9202

The **Campus Pantry** is open for students to receive supplemental groceries at no cost. Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live and believes this may affect their performance in the course, is urged to contact the Dean of Students for support.

Website: <https://campuspantry.arizona.edu>

**Counseling and Psych Services (CAPS)** provides mental health care, including short-term counseling services.

Website: <https://health.arizona.edu/counseling-psych-services>

Phone: (520) 621-3334

The **Dean of Students Office's Student Assistance Program** helps students manage crises, life traumas, and other barriers that impede success. The staff addresses the needs of students who experience issues related to social adjustment, academic challenges, psychological health, physical health, victimization, and relationship issues, through a variety of interventions, referrals, and follow up services.

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

Email: [DOS-deanofstudents@email.arizona.edu](mailto:DOS-deanofstudents@email.arizona.edu)

Phone: (520) 621-7057

The **Survivor Advocacy Program** provides confidential support and advocacy services to student survivors of sexual and gender-based violence. The Program can also advise students about relevant non-UA resources available within the local community for support.

Website: <https://survivoradvocacy.arizona.edu/>

Email: [survivoradvocacy@email.arizona.edu](mailto:survivoradvocacy@email.arizona.edu)

Phone: (520) 621-5767

### Confidentiality of Student Records

Student records are kept confidential as per [FERPA policy](#).

**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.

**Class Schedule**

Module	Week	Dates	Topics
Key concepts and ADP station training.	Week 1	Aug 26 & 28	ADP Introduction, Shadow Play
	Week 2	Sep 2 & 4	Seeing is Believing, Gravitational Forces
	Week 3	Sep 9 & 11	Exoplanet Density, Exoplanet Settlement
	Week 4	Sep 16 & 18	Practice Workshop
Deliver outreach workshops	Week 5	Sep 23 & 25	
	Week 6	Sep 30 & Oct 2	
	Week 7	Oct 7 & 9	
	Week 8	Oct 14 & 16	
	Week 9	Oct 21 & 23	
	Week 10	Oct 28 & 30	
	Week 11	Nov 4 & 6	
	Week 12	Nov 11 & 13	
	Week 13	Nov 25	Optional class – Thanksgiving Break
Course synthesis & final project	Week 14	Dec 2 & 4	
	Week 15	Dec 9	Optional class – Reading period
	Week 16	N/A	No class (UA finals period)