



GEOL 0870 The Planets

Fall Semester 2025

Tuesday & Thursday 10.00 – 10.50 pm, 150 Chevron Science Center

Instructor Information

Instructor

Ian T.W. Flynn

Email

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Office Location & Hours

SRCC 510, Mo 1 – 3 P.M.

Teaching Assistant

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SRCC 309, T.B.D.

General Information

Description

The solar system that we inhabit is a fascinating realm, that has been constantly evolving for nearly 5 billion years. It contains numerous planetary bodies of various shapes, sizes and compositions. This course aims to give an overview of our planetary neighborhood; the geology of the planets and moons, the processes that occur, the formation of our solar system, and how we are looking to observe and explore this region of space.

Learning Goals

- Develop an understanding of how the Solar System formed
- Understand the different geologic processes that occur and have occurred on different planetary bodies
- Appreciate and learn how we use different methods to study the various objects in our solar system
- Develop teamwork and communication skills through participation in the group project assessment

Recitations

It'd be fantastic if we were able to go out into the Solar System to study it directly, but sadly we aren't at that phase of human development yet. Therefore, you'll complete recitation exercises to better understand the processes that occur in the universe. You will undertake a variety of different exercises from analyzing rock samples to studying different wavelengths of light to complement the in-class discussion and lectures.

To complement the recitation exercises, you will also be undertaking a group project. I will give you more information on this project after the 1st Mid-Term exam. You will work in groups of 5 or 6 (based on recitation groups) to develop a mission proposal to send an instrument to a planetary body in the solar system. You will present a 5 to 7 minute “elevator pitch” to myself and the TA on why your mission should be selected, along with an accompanying fact sheet. This project will be worth 10% of your grade, and so doing it well is important!

Grading Breakdown and Policies

Score	Grade	Your final grade will be assessed based upon the following components – <i>Recitations = 30 %, Mid-Term = 30 %, Final = 30 %, Group Project = 10 %.</i> If a curve is required, it will be calculated at the end of the semester and will be based on the average of the entire class and the median grade will be equal to a grade of a C+/B-.
93 +	A	Exams: Exams are multiple choice, and there are TWO mid-term exams. To give you the best chance of getting a good grade, I will drop the mid-term with the lowest grade from your overall score. For example, if you get 100% on the first one, then you don't have to do the second! However, if you only get 50 %, you will need to take the second mid-term to try and boost your grade. Mid-Term exams will take during class time , the final exam date is T.B.D., and you MUST attend. Exams for this class are non-cumulative. If you are going to have an issue with taking any exam (with a legitimate excuse, i.e., doctor's note) you must tell me at least 24 hours in advance of the exam time so that an alternative solution can be found. Make-up exams will only be in-person and must be completed within 1 week of the original exam date. It is your responsibility to keep up with class material and pay close attention to your email, so you get any important course announcements. I provide class notes before each lecture; however, these only provide an overview of the topics that we are discussing. There are many examples that I cover in more depth in class that will not be in the notes, but these still might be on your exams!
90 - 92	A -	
87 - 89	B +	
83 - 86	B	
80 - 82	B -	
77 - 79	C +	
73 - 76	C	
70 - 72	C -	
67 - 69	D +	
63 - 66	D	
60 - 62	D -	
< 60	F	

Recitations: These are held every week and attendance is **mandatory**. You will be given an assignment to complete for this portion each week which you will do in class. Your TA will be available during class time to help you complete it. Recitations are to be handed in **at the end of your recitation class**. You can **only** make up these recitations with a legitimate excuse (e.g., doctor's note etc.) You **CANNOT** hand in all the recitations at the end of the semester or make them up **or making them after the recitation without prior permission (and must be within 2 weeks)** – you will receive a 0. If you are having issues with recitation attendance, **please let your TA know A.S.A.P.**

Recommended Reading

Universe: The Solar System (6th Ed.) 2019, W.H. Freedman, R.M. Geller & W. J. Kaufmann, pp. 624

Additional Reading

Pathways to Astronomy (5th Ed.) 2017, S. Schneider & T. Arny, pp. 800

21st Century Astronomy (6th Ed.) 2019, L. Kay, S. Palen & G. Blumenthal, pp. 685

Course Schedule

Week	Date	Topic	Reading (Freedman)	Notes
1	Aug 26	Syllabus Day/Intro	-	NO RECITATIONS
	Aug 28	History of Planetary Science	-	
2	Sept 2	Observations of the Solar System Pt. 1	Chapter 4	Recitation #1 - Spectroscopy
	Sept 4	Observations of the Solar System Pt. 2	Chapter 4	
3	Sept 9	The Tools of Planetary Science	Chapters 5 & 6	Recitation #2 – Mineral Identification
	Sept 11	Energy Sources/Scientific Method	Chapter 1	
4	Sept 16	Our Planetary System	Chapter 7 & 8	Recitation #3 – Geologic Time and Superposition
	Sept 18	Our Planet Earth	Chapter 9	
5	Sept 23	The Earth's Moon Part I – Formation and Interior	Chapter 10	Recitation #4 – Earth's Plate Tectonics
	Sept 25	The Earth's Moon Part II – Surface Geology and Exploration	Chapter 10	
6	Sept 30	MID-TERM 1	-	Weeks 1 – 5 Recitation #5 – Igneous Rocks and The Moon
	Oct 2	Planetary Mission Development		
7	Oct 7	Mercury – The Innermost Planet	Chapter 11	Recitation #6 – Future Mission Planning
	Oct 9	Venus – Earthlike yet unique		
8	Oct 14	Mars Part I – Overview	Chapter 11	Recitation #8 – Mars Crater Counting
	Oct 16	Mars Part II – Fire and Ice (and Water)	Chapter 12	
9	Oct 21	Exploring Jupiter	Chapter 12	Recitation #7 – Volcanism on Mars
	Oct 23	The Moons of Jupiter	Chapter 13	
10	Oct 28	Saturn		Weeks 6 – 9 Recitation #9 Group Project Updates
	Oct 30	Saturn's Moons		
11	Nov 4	Distant Worlds – Uranus	Chapter 14	Recitation #10 – Uranus, Neptune, and Pluto
	Nov 6	MID-TERM 2	Chapter 14	
12	Nov 11	Distant Worlds – Neptune	Chapter 14	Mission Presentations
	Nov 13	Pluto, The Kuiper Belt and Oort Cloud	Chapter 14	
13	Nov 18	Meteorites, Asteroids and Comets	Chapter 16	Recitation #11 – Asteroid Impacts (Meet in SRCC 210)
	Nov 20	The Sun	Chapter 8	

Week	Date	Topic	Reading (Freedman)	Notes
14	Nov 24	THANKSGIVING BREAK – NO CLASSES	- -	NO CLASS/RECITATIONS
15	Dec 2	Planetary System Formation	-	<i>Recitation #12 – Exoplanets and Kepler's Laws</i>
	Dec 4	The Search for Exoplanets	-	
16	Dec 9	Life on other Planets	Chapter 27	Weeks 10 - 15
	Dec 11	FINAL EXAM: T.B.D.	-	

Additional Information

Academic Integrity

All students are expected to adhere to the standards of academic honesty. Any student engaged in cheating, plagiarism, or other acts of academic dishonesty would be subject to disciplinary action. Any student suspected of violating this obligation for any reason during the semester will be required to participate in the procedural process, initiated at the instructor level, as outlined in the [University Guidelines on Academic Integrity](#). This may include but is not limited to the confiscation of the examination of any individual suspected of violating the University Policy.

Email Policy: Your University e-mail address (username@pitt.edu) is used by the University (and me) for official communication. Students are expected to read e-mail sent to this account on a regular basis. For this course, you will either receive information there, or on Canvas. Failure to read and react to an email or Canvas message/announcement in a timely manner does not absolve the student from knowing and complying with the content of the communications. The University provides an e-mail forwarding service that allows students to read their e-mail via other service providers. Students that choose to forward their e-mail from their pitt.edu address to this address do so at their own risk. If e-mail is lost as a result of forwarding, it does not absolve the student from responding to official communications sent to their University e-mail address. I will **not** respond to emails out of hours (i.e., over weekends and weekday evenings after 6 PM).

Statement of Classroom Recording

To ensure the free and open discussion of ideas, students may not record classroom lectures, discussion and/or activities without the advance written permission of the instructor, and any such recording properly approved in advance can be used solely for the student's own private use.

Disability Resources:

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact the Office of Disability Resources and Services, 216 William Pitt Union, 412-648-7890/412-383-7355 (TTY), as early as possible in the term. Disability Resources and Services will verify your disability and determine reasonable accommodations for this course.

Diversity Statement:

Students, faculty, and guests represent diverse perspectives, backgrounds, and experiences which enrich our research and educational environment. Individuals of all races, colors, ancestries, genders, marital status, familial status, ages, backgrounds, beliefs, ethnicities, gender

identities and expressions, national origins, religious or political affiliations, sexual orientations, abilities, and other visible and nonvisible differences are welcomed in this class. We urge all to be mindful in this classroom and to feel responsible for creating a space that is intellectually rigorous and is a respectful, welcoming, and inclusive environment for everyone. No demeaning or discriminatory behavior will be permitted. If you feel uncomfortable, please feel free to approach me during or after class to discuss the situation.

In this class, we will have the chance to indicate the name that we prefer to be called and, if we choose, to identify pronouns with which we would like to be addressed. Please approach me if you have such preferences and I will do my best to address and refer to all students accordingly and support classmates in doing so as well. I will endeavor to use gender-inclusive and nondiscriminatory language in all course communication and materials. Your suggestions for how to improve the effectiveness of the course for you personally or other student groups are encouraged and appreciated. Our faculty is committed to communication from students without judgement. In addition, if any of our class meetings conflict with your religious events, please let me know so arrangements can be made.

Your Well-being Matters

University can be an exciting and challenging time for students. Taking time to care for yourself and seeking appropriate support can help you achieve your academic and professional goals. You are encouraged to maintain a healthy lifestyle by eating a balanced diet, exercising regularly, avoiding drugs and alcohol, getting enough sleep, and taking time to relax.

It can be helpful to remember that we all benefit from assistance and guidance at times, and there are many resources available to support your well-being while you are at Pitt. If you or anyone you know experiences overwhelming academic stress, persistent difficult feelings and/or challenging life events, you are strongly encouraged to seek support. In addition to reaching out to friends and loved ones, consider connecting with a faculty member you trust for assistance connecting to helpful resources. The University Counseling Center is also here for you. You can call 412-648-7930 at any time to connect with a clinician.

If you or someone you know is feeling suicidal, please call the University Counseling Center at any time at 412-648-7930. You can also contact Resolve Crisis Network at 888-796-8226. If the situation is life threatening, call Pitt Police at 412-624-2121 or dial 911.

Teaching Surveys

Students in this class will be asked to complete a *Student Opinion of Teaching Survey* from the Office of Measurement and Evaluation of Teaching (OMET). Surveys will be sent via Pitt email and appear on your CourseWeb landing page during the last three weeks of class meeting days. Your responses are anonymous. Please take time to thoughtfully respond, your feedback is important to me. [Read more](#) about *Student Opinion of Teaching Surveys*.