

GEOL 2990 – Mars, Moons & Asteroids



Instructor: Nico Perdrial nicolas.perdrial@uvm.edu
Office: Delehanty 319
Office hours: Thursdays and Fridays, 9 -10 am in person, on TEAMS and by appointment

Class Times: Tuesdays & Thursdays, 2:50 – 4:05 pm, LAFAYETTE L102

Description: Space exploration is a relatively new human endeavor that has greatly improved our understanding of our own planet and solar system. For that reason, any human mission to the solar system will have geology as one of its primary goals. During this course we will explore the geologic objects of the solar system to understand Earth processes. By dissecting the objectives, results and conclusions of the most recent space missions to nearby Mars, Luna, asteroids and even distant ice moons we will discover what new knowledge was garnered during these missions and what future missions can teach us about our planet.

The integrality of the class will be based on recent and future scientific missions from NASA, ESA, JAXA and CNSA and include guest lectures from scientists involved in these missions.

The fundamental question that this class aims at answering is:

What can the study of other planetary bodies teach us about Earth?

Course Goals: At the end of the course you will be able to

- Critically assess the relevance of space missions,
- Understand how space missions help us understand our planet,
- Discuss and summarize complex ideas,
- Discover the breadth of disciplinary perspective in space exploration.

Guest lectures: Throughout the semester we will have the privilege to welcome remote guests involved in a number of space missions in the past and the future, including academics, NASA, JPL and SETI researchers. It will be a fundamental part of the class and I expect all students to be fully engaged during these one-of-a-kind lectures. We will use material from these lectures to discuss specific topics afterwards.

Assessment: I will assess your learning through a variety of ways, including weekly online quizzes, short reports, participation and a final group project.

The grading will be as follow: Quizzes: 30%; Reports: 30%; Guest/Discussion contributions: 15%; Final project: 25%.

Quizzes: Based on course content, you will have to take weekly 10-20 questions online quizzes.

Reports: You will be asked to regularly (6 times) produce a 1-page report on a topic relevant to the course.

Discussions: Although discussions are encouraged in the class, we will have 3 formal discussion sessions on each of Mars, Moons and Asteroids topics to summarize the content in relation to Earth.

Final Project: In groups of 4, you will be tasked with interviewing one of our guest lecturers or a scientist of your choice and prepare a document (article, video, poster...) for your final project.

Brightspace: Brightspace will be used regularly during the course. Materials, assignments and grades will be regularly posted on the course Brightspace page. Make sure to access it often.

Textbook: No textbook is required

Tentative schedule (some guests may be added at a later time):

		Tuesday	Thursday	Quiz	Reports	
Week #1	Aug 29 & 31	Syllabus - Solar system	Planets and Moons	Syllabus		
Week #2	Sept 5 & 7	Mars - Planet basics	Mars - History of missions	Mars basics	Earth/Mars Comparison	
Week #3	Sept 12 & 14	Mariner	MGS and MRO	Mars from afar		
Week #4	Sept 19 & 21	Pathfinder	Spirit	Rovers		
Week #5	Sept 26 & 28	MAVEN	Insight - Mark Panning (JPL)	Insight	Rover Payloads	
Week #6	Oct 3 & 5	Goodnight Oppy	MARS 2020 - photo gallery (group work)	Remote geology		
Week #7	Oct 10 & 12	Curiosity	Curiosity - Liz Rampe (NASA)	Lessons from curiosity		
Week #8	Oct 17 & 19	Lessons from current missions (discussion)	Group work - final project	Designing future missions	Mars - unknowns	
Week #9	Oct 24 & 26	Appolo missions	Artemis	Luna		
Week #10	Oct 31 & Nov 2	Artemis - Shannon Kobs (Idaho State)	Lunar Lab - Juliane Gross (NASA)	Training Astronauts	Lunar Lab Summary	
Week #11	Nov 7 & 9	Why the Moon? (discussion)	Artemis - next steps	Artemis		
Week #12	Nov 14 & 16	Europa - Cynthia Phillips (JPL)	Europa, Enceladus, etc	Exomoons	Choose your moon	
Week #13	Nov 21 & 23	Thanksgiving Break				
Week #14	Nov 28 & 30	Asteroids basics	Osiris Rex & DART - Mike Nolan (UofA)	Dart and Osiris		
Week #15	Dec 5 & 7	Psyche and Mining (discussion)	Group work - final project		Mining Asteroids	
Week #16	Dec 12 & 14	Exam period				Video interviews
	legend:	Mars	Discussions			
		Moons	Guest			
		Asteroids	Group work			

Student Learning Accommodations: In keeping with University policy, any student with a documented disability interested in utilizing accommodations should contact ACCESS, the office of Disability Services on campus. ACCESS works with students and faculty in an interactive process to explore reasonable and appropriate accommodations via an accommodation letter to faculty with recommended accommodations as early as possible each semester. Contact ACCESS: A170 Living/Learning Center; 802-656-7753; access@uvm.edu; www.uvm.edu/access

Writing Center: For support and feedback at any point in the writing process, you can consult with a tutor at the Writing Center. For more information about the Writing Center, including a list of tutors and their majors/minors, see www.uvm.edu/writingcenter. To make an appointment online, go to www.uvm.edu/tutor. At the end of your session, you can request that the tutor email me a copy of your session description.

UVM's policy on disability certification and student support:
www.uvm.edu/~uvmppg/ppg/student/disability.pdf

Religious Holidays: Students have the right to practice the religion of their choice. If you need to miss class to observe a religious holiday, please submit the dates of your absence to me in writing by the end of the second full week of classes. You will be permitted to make up work within a mutually agreed-upon time.

Academic Integrity: The policy addresses plagiarism, fabrication, collusion, and cheating.
<http://www.uvm.edu/~uvmppg/ppg/student/acadintegrity.pdf>

Grade Appeals: If you would like to contest a grade, please follow the procedures outlined in this policy:
<http://www.uvm.edu/~uvmppg/ppg/student/gradeappeals.pdf>

Grading: For information on grading and GPA calculation, go to www.uvm.edu/academics/catalogue and click on Policies for an A-Z listing.

Code of Student Rights and Responsibilities: www.uvm.edu/~uvmppg/ppg/student/studentcode.pdf

FERPA Rights Disclosure: The purpose of this policy is to communicate the rights of students regarding access to, and privacy of their student educational records as provided for in the Family Educational Rights and Privacy Act (FERPA) of 1974. <http://www.uvm.edu/~uvmppg/ppg/student/ferpa.pdf>

It is forbidden to use the computers for other purposes than the course requirement during class meeting time. Therefore you are expected to not check emails, facebook, twitter or other applications/websites non-related to the class during class meeting times.