

University Puerto Rico, Mayagüez
Faculty of Arts and Sciences
Geology Department

Course Title: Special Problems in Petrology (Geology and Structure of Mars)
Class Code: GEOL 6994-040 (3 credits)
Semester: Fall 2016
Meeting Times: R 15:30-18:30
Room: F-201

Course Description:

Introduction to the structure and geology of the planet Mars. Various properties and processes will be discussed, along with the remote sensing techniques which were used to determine these traits. Also, the chemical signatures observed in the SNC meteorites will be discussed with emphasis on the implications for the internal chemistry and structure of the planet Mars.

Course Objectives:

To understand the internal structure of Mars and how it is determined.

To be familiar with various surface features and geomorphology of Mars as consequences of recent igneous activity and/or the action of liquid water.

To be able to discuss some of the finer points regarding the chemistry of the Martian crust and mantle, as observed in the SNC meteorites.

To appreciate the surface condition of Mars and the implications toward human habitability and terraforming.

Instructor: Dr. Lysa Chizmadia
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Phone Number: 787 832-4040 x3004
Office Room #: Physics FA-201
Office Hours: R 15:30-18:30

Textbook: Although there is no textbook for this class, the students will be responsible for reading the assigned peer-reviewed papers.

Grading:

Oral Presentations	(3)	30%
Class Participation		15%
Take-Home Midterm Exam		25%
Final Exam		30%

Class Rules:

- **Come prepared!** Read the paper(s) before the corresponding oral presentation & print out lecture slides.
- Suggested class materials: textbook, colored pens and/or pencils, highlighters, notebook, ruler, calculator, **digital camera**, etc.
- **Exams and lectures are in English.** Please feel free to record presentations, ask me questions or email me any questions. Some of the vocabulary words are not similar in Spanish. You can ask questions during the exams, but I will not give you definitions, only synonyms if they exist.
- Exams will be given on their dates. They will consist of essay-style questions. You will be required to write in English and draw schematic figures. Make-up exams will be made only by the discretion of the professor and never without EXTRAORDINARY reason. If you miss an exam, you must contact the professor within 24 hours and, if permitted, take the make-up exam at the next office hour.
- Oral Presentations are required on their due dates. There will be no make-ups. Any delays will adversely affect the schedule of other students' presentations. Each student will be responsible for 3 oral presentations based on peer-reviewed papers. Each presentation is worth 10% of your final grade.
- The class participation grade will be determined by attendance, asking questions after presentations, and participating in the discussion after the presentations.

Special Accommodations: Those students with learning disabilities must contact the Dean of Students with the proper paperwork. I will be happy to accommodate those students with proper paperwork.

Academic Honesty: Those students found violating the student code of conduct (including plagiarism) will be reported to the Dean of Students and are subject to disciplinary action (Including failure of this class and expulsion from the university).

Course Schedule

Week#	Date	Subject Material	Reading
1	R 18 Aug	Introduction & Course Overview Geography of Mars	n/a
2	R 25 Aug	Crust of Mars: Introduction Crust of Mars: Surface Processes	Smith et al. 1999; Carr 2006 Hoffman; Coleman 2003; Stewart & Nimmo 2002
3	R 1 Sep	Crust of Mars: Cratering Chronology	Hartman & Neukum 2001; Head et al. 2001
4	R 8 Sep	Mantle of Mars: Introduction	Runcorn (ed.) 1967; Barlow 2008
5	R 15 Sep	Atmosphere & Climate: Dust Dynamics Ice Cycling	Guzewich et al. 2016; Barlow 2008 Brown et al. 2016; Steele et al. 2014
6	T 20 Sep	<i>Thursday Scheule: Phobos & Deimos</i>	Andert et al. 2011; Rosenblatt & Charnoz 2012; Citron et al. 2015
	R 22 Sep	<i>Friday Schedule: No Class</i>	
7	R 29 Sep	Water on Mars Geomorphological Evidence	Dernandez-Remolar et al. 2013; Nuding et al. 2014 Cabrol & Grin (Eds.) 2010; Carr 2006
8	R 6 Oct	Brine Stablization Brine-resistant Life	Hecht et al. 2009; Chevrier et al. 2009; Smith et al. 2014 Oren et al. 2013
9	R 13 Oct	Take Home Midterm Handout	

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Week #	Date	Subject Material	Reading
10	R 20 Oct	<i>Friday Schedule: No Class</i> Take Home Midterm Due	
11	R 31 Oct	Mars Missions: Viking Mission Mars Missions: Viking Experiments	Soffen 1977; Snyder 1977; Klein 1977; Biemann et al. 1977 Horowitz et al. 1977; Levin & Straat 1977; Oyama & Berdahl 1977
12	R 3 Nov	Mars Missions: Pathfinder Mars Missions: MER	Golombek et al. 1999; Bell et al. 2000 Arvidson, et al. 2006; Squyres et al. 2006
13	R 10 Nov	Mars Missions: Beagle 2 Mars Missions: Global Surveyor	Acuna et al. 1998; Mellon et al. 2000
14	R 17 Nov	SNC Meteorites: Introduction SNC Meteorites: Lab	
15	R 24 Nov	<i>Thanksgiving - No Class</i>	
16	R 1 Dec	Mars Missions: Phoenix Mars Missions: Science Lab	Arvidson et al. 2009; Hoffman et al. 2008 http://www.sciencemag.org/site/extra/curiosity/
17	R 8 Dec	Hability of Mars & Human Exploration Terraforming Mars	McKay et al. 1991; NASA Special Publication #6107; Mars Institute Zubrin 2004; Fogg 2004; Rapp
10-17	Dec	Final Exam: TBA	

Schedule subject to change