Mars

PTYS/GEOL/ASTR 442/542 Syllabus – Spring 2015

Professor Shane Byrne
524 Kuiper Space Sciences
(520) 626-0407
shane@lpl.arizona.edu

Professor Alfred McEwen
204 Sonett Building
(520) 621-4573
mcewen@lpl.arizona.edu

Times and locations:

- Two lectures per week on Monday and Wednesday from 10am to 11:15pm.
- First lecture on Wednesday, January 14th.
- Lectures will be held in room 312 of the Kuiper Space Sciences building.
- Friday 10am might be used for a makeup class or two

We will be available for questions and discussion after lectures. If you need help and cannot make this time then please contact either of us by email to make another arrangement. We have a general open door policy too; but if you don't email in advance then there's no guarantee that we'll be available.

Purpose of course:

In-depth study of the planet Mars, including geology, geophysics, atmospheric science, climate change, the search for life, and the history and future of Mars exploration. There will be guest lectures from professors and research scientists with expertise in various aspects of Mars. There will be lots of discussion of recent results and scientific controversies. The course is intended for upper division and graduate science majors or minors.

The student who successfully completes this course should have a good basic understanding of all aspects of Mars and how it compares with Earth and other planets. Students should acquire a new understanding and appreciation for exploration and scientific research, and sharpen their skills in critical thinking. Prerequisites: strong undergraduate background in the physical sciences including several introductory courses in physics, geology, planetary science or astronomy. Facility with mathematical analysis (including basic calculus) is required.

UofA is an international center for Mars exploration and research. This course will include visits to various UA operations centers: the High Resolution Imaging Science Experiment (HiRISE) on Mars Reconnaissance Orbiter in the Sonett building, and the Drake building where the Phoenix lander was operated (also SW meteorite center with meteorites from Mars).

Course Website:
Lectures, homework assignments and general information on the course will be posted on a class website at:

http://www.lpl.arizona.edu/~shane/PTYS_442_542_2015

Course credit:
There will be no final or mid-term exam in this course.

Homework will be assigned every two weeks in class. In general, this homework will be due two weeks from the date on which it is assigned. Some of these assignments may be based on analysis of spacecraft data and will require students to utilize computational resources such as the software JMars. We will devote a lecture to demo-ing this software. Late homework receives half credit and homework submitted a week or more after the due date receives no credit. If you are unable to complete a homework assignment on time (and have a good reason) you must discuss this with us *before* the due date to avoid losing credit.

All students will participate in targeting and analyzing your own HiRISE image of Mars. We will need to quickly get the candidate HiRISE targets defined for acquisition in March. There are workstations available in the Planetary Image Research Lab (PIRL) in Sonett Space Science Annex. Each student will present interpretations of their image later in the course after the data have been returned to Earth.

Graduate students will also be expected to lead a 30-minute class presentation and discussion about a Mars topic or current controversy of their choice (with instructor's concurrence).

A final course project (which may be an extension of the HiRISE image analysis) will be required of all students on some subject relevant to the content of the course. Students are encouraged to interact with the instructors early in the semester to choose a topic for their project. A 10-15 minute oral presentation and written report on this project will be due at the end of the semester. For undergraduates (442), this project may be a (thorough) literature review of a chosen topic. For graduate students (542), it should also contain original research or critical analysis.

Final grades are determined from:

Homework	35%
HiRISE image report	20%
Class Participation (442/542) & 30-minute presentation (542)	10%
Final project - Oral	15%
Final project - written	20%

Grades will be assigned according to the following scale. If you score in this range then you are guaranteed at least this grade.	90-100%	A
	80-90%	B
	70-80%	C
	50-70%	D
	0-49%	E

General Policies:

Attendance is required from all students at all lectures, unless excused. While in class, students are expected to conduct themselves in a considerate manner. Late arrivals and early departures from class are disruptive and not permitted. Students must disable cell phones for the duration of the class and refrain from answering calls (please take any emergency calls outside and explain them later). Students that fail to attend classes or persistently disrupt the class may be removed through the administrative drop procedure.

Students are encouraged to discuss approaches to solving homework problems and their class projects with each other; however, all work submitted must be the student's own. Copying of homework from other students, text from previously published papers without reference or solution sheets from previous years is not acceptable. Previously completed course projects may not be submitted for credit in this course. Plagiarism of published research for a class project will result in zero credit for that portion of the course. All students are expected to follow the UA code of academic integrity, which can be read here:

http://deanofstudents.arizona.edu/codeofacademicintegrity

The classroom is a communal resource that should be treated with care and respect. No food or drink (except water) is permitted in this room. Please clear up your seating area after use and don't leave any debris that others will need to clean up.

Students with Disabilities:

If you anticipate barriers related to the format or requirements of this course, please meet with us so that we can discuss ways to ensure your full participation in the course. If you determine that disability-related accommodations are necessary, please register with Disability Resources (621-3268; drc.arizona.edu) and notify us of your eligibility for reasonable accommodations. We can then plan how best to coordinate your accommodations.

Plagiarism

Plagiarism will be checked for using online software. The proper forms of quoting other sources will be outlined in class. For UA policies against plagiarism, see the Student Code of Academic Integrity: http://dos.web.arizona.edu/uapolicies

UA policies against threatening behavior by students: http://policy.web.arizona.edu/~policy/threaten.shtml.