PTYS 411/511

Geology and Geophysics of the Solar System

Syllabus – Spring 2010

Professor Shane Byrne
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Times and locations:

- Two lectures per week on Tuesday and Thursday from 11am to 12:15pm.
- First lecture on Thursday, January 14th.
- Lectures will be held in room 312 of the Kuiper Space Sciences building.

Professor Byrne will be available for questions and discussion, from 1pm until 4pm on Thursdays. If you need help and cannot make this time then please contact him by email to make another arrangement.

What students should know coming into this course:

There are no explicit course prerequisites and anyone may enroll; however, this course is intended for advanced undergraduate and beginning graduate students and as such contains advanced material. Many of the lectures will contain material of a mathematical nature and at least a basic knowledge of calculus will be necessary to understand it. Some background knowledge of terrestrial geology would be of great benefit but is not required.

Students may attempt the course without a mathematical or geological background, although extra effort will be required on their part. Please speak to the instructor if you have any questions.

What students should know coming out of this course:

The goals of this course are to give the student a thorough understanding of geologic processes operating on planetary bodies and how they have shaped the geologic history of solar system bodies. Some of the material covered may be considered by some to be more geophysics than geology, but this material is also necessary to fully understand how planetary surfaces have evolved over time.

In this class we will explore how a variety of geologic processes, such as impact cratering, volcanism, tectonics, fluvial and atmospheric, shape planetary landscapes. Interspaced with these lectures we will review the geologic history of solar system bodies and processes unique to these individual bodies.

Textbooks:
There are no required textbooks in this class. Any reading assigned will be provided by the instructor in hardcopy or electronic form. Optional textbooks such as "The new solar system", edited by Beatty, Peterson and Chaikin, or "Encyclopedia of the solar system" by McFadden, Weissman and Johnson are recommended as good background reading.

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_411_511

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

Homework will be assigned every two weeks in class on Thursdays. In general, this homework will be due two weeks from the date on which it is assigned. Some of these assignments will based on analysis of spacecraft data and will require students to utilize the computational resources here at the Lunar and Planetary Laboratory. 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 the instructor *before* the due date to avoid losing credit.

A final course project will be required of all students on some subject relevant to the content of the course. Students are encouraged to interact with the instructor 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.

The class is offered to both graduate and undergraduate students and all students are expected to attend all lectures. However, there are important differences in expectations between graduates (taking PTYS 511) and undergraduates (taking PTYS 411).

- Graduate students will meet with the instructor once per week to discuss papers relevant to recent lectures. Each graduate student will lead two discussions over the course of the semester. Other graduate students are expected to participate vigorously (undergraduates are welcome, but not required, to take part).
- Additional questions will appear on some homework sets for graduate students, undergraduates may optionally complete these for extra credit.

- The final project for undergraduate students may be a (thorough) literature review of their chosen topic. However, graduate students are expected to contribute some original piece of research in addition to understanding the literature on their topic. Undergraduates may also contribute original research in their projects for extra credit.

Grading policy:

Final grades for both graduates and undergraduates are determined from:

	Graduate – PTYS 511	Undergraduate – PTYS 411
Homeworks/Labs	40%	60%
Final project - Oral	20%	20%
Final project - written	20%	20%
Paper discussion group	20%	-

Marks for the 'paper discussion group' section are based both on the sessions the student leads and participation in the other sessions. You can miss up to 2 sessions (that aren't your own!) and not lose any points. After this you lose 2 points, out of the available 20, for each session missed.

Grades will be assigned according to the following scale. Grades won't be rescaled to ensure that any particular statistical distribution is met.

90-100%	A
75-89%	B
60-74%	C
50-59%	D
0-49%	E

General Policies:

Attendance is required from all students at all lectures. 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 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, or text from previously published papers without reference, 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.

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.