

GEOL412

Geology of Terrestrial Planets

Monday, 11:00 AM –1:50 PM, PLS 1164

Fall 2012 Syllabus

Table of Contents

Instructor 2

Description 2

 Lectures : 2

 Labs 3

Class Materials 3

 Text 3

 Website 3

Grading 3

 Homeworks (50pts) 3

 In-Class discussion (25 pts) 4

 Final exam (25 pts) 4

 Grade calculation: 5

 Appeal of grades 5

 CORE/GED 5

Expectation of students 5

 Prerequisite knowledge 5

 Academic integrity 5

 Readings 6

 Attendance 6

 Electronic devices 6

 Class evaluation 6

Special Needs 7

 Students with Disabilities 7

 Religious Observances 7

Schedule 8

Instructor

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Don't hesitate to send me an email at the address above. It is the most reliable way to contact me.

Description

Geological features of Mercury, Venus, Mars and the Moon with an emphasis on results from recent NASA planetary mission. Class is organized to follow geological processes or observation throughout the inner solar system. Topics covered include interior structure, impact cratering, tectonic and volcanic history, surface conditions and climate change, and habitability.

Each class will consist of three parts. 1) A lecture describing a suite of observations or a geological process at work in the inner solar system. 2) A discussion based on a reading assignment related to the previous week's topic. 3) The preparation of a written report on a topic linked to the discussion. Part 1 will last approximately 1h15min, Part 2 45 min, and Part 3 30 min. A 15 min break will be scheduled between parts 1 and 2. Exact duration may vary as to adapt to the material that needs to be covered.

Occasionally, a guest lecturer will describe recent research in planetary sciences. In that case, we will skip parts 2 and 3.

Homeworks will be assigned most weeks, due the following week. Several exercises will consist of a self-guided exploration of mapping and other database utilities available on the internet. Other may require simple programming of a geophysical problem.

Every student will be expected to read assigned papers before class and to post comments on a class-specific blog.

The class will contain a final exam in the form of an essay to be written during the university-scheduled final time.

Lectures :

Mondays, 11:00 AM – 1:50 PM in PLS 1164

Labs

There are no labs associated with this class.

Class Materials**Text**

Reading material is available through the ELMS online reserve system. The readings are mandatory as the text is more complete than the summary class notes. Chapters will be selected from

- *Planetary Surface Processes*, by H Jay Melosh, Cambridge University Press, 2010, ISBN 978-0521514187
- *Planetary Sciences*, by Imke de Pater and Jack J. Lissauer, Cambridge University Press, 2010, ISBN 978-0521853712

Reading assignments may also consist on selected articles from major scientific journals, such as the *Annual Review of Earth and Planetary Sciences*, *Space Science Review*, *Planetary and Space Science*, *Earth and Planetary Science Letters*, *Icarus*, *Journal of Geophysical Research*, *Reviews of Geophysics*, *Science*, and *Nature*, all of which can be accessed electronically through the UMD library system.

Website

A website for the class is available through the University ELMS/blackboard system. Follow the link to <https://elms.umd.edu/>, enter your directory ID and password. If you are registered, you should be able to see GEOL412 in your list of classes and access the website that way.

The website will contain lecture synopsis. In general, these synopses are not full lecture notes. If you miss a lecture you must get full notes from a colleague.

Grading**Homeworks (50pts)**

Problem sets will be assigned almost every Monday, due the following week. As there is no TA for the class, students need to talk to me (Dr. Montesi) when they encounter any problem. Please don't be shy! I am here to help you, and I hope you will come and seek help if you have any difficulty. I am not interested in correcting wrong or incomplete homework, so do come and ask me before it's too late!

You are welcome to discuss with each other the problem set but you need to write the answers yourself.

There will be no make-up homework because of the high frequency of assignments. You will receive a 0 mark for any late homework. However, at least one homework grade (the lowest) will be dropped to accommodate unavoidable difficulties. Request for delays

must be received at least by 4pm on the day before the homework is due, and be accompanied with a justification.

Problem sets will be available through the ELMS website. You can choose whether to submit your answers online or on papers. Grades and corrected versions will be posted online hopefully by the next class.

Occasionally, homework may require access to Internet tools, computer calculation and simple programming (excel or matlab), and use of the mapping software GMT (guided tutorials will be available). Computer labs with the required software are available from OIT:

CSS Lab Hours (rooms 3330 & 3332):

Mon. through Thurs. open 8:00 am - 10:00 pm.

Fri. open 8:00 am - 5:00 pm

Closed on Sat. & Sun.

In-Class discussion (25 pts)

Discussion of scientific papers is an integral part of the class. Each student is required to participate actively to the discussion of each paper and to post a comment or question related to the paper in advance of discussion (10 pts). Oral participation to the discussion is counted for 5 pts. A short write-up (1 page maximum) on a topic related to the discussion will be collected at the end of each session. (10 pts). For each component, the lowest grade will be dropped before averaging. When leading discussion, students should not summarize or simply present the study but identify a handful of fundamental questions to complete the understanding of the topic (10 pts).

Final exam (25 pts)

The final exam will consist in the production of an essay during the Standard Final Examination assigned by the University. The topics of the essay will be given at the start of the exam and copies will be collected at the end. The exam is open book, which means that the students are allowed to consult any online resource they see fit. The essay topic will be open-ended. It will be graded as follows

- Does the essay contain a clear thesis to answer the question posed? (2.5pts)
- Does the essay refer to specific facts and observations to support its thesis? (7.5 pts)
 - At least three subtopics should be discussed.
 - Each subtopic should contain sufficient supporting evidence; Said evidence should be concrete.
- Is the essay well organized? (10 pts). Does it contain:
 - An introduction that presents the topic and the structure of the essay
 - A conclusion summarizing the principle subtopic and brings them together to answer the question posed.
- Is the essay clearly written (5 pts)?

- Each paragraph should focus on a specific idea. At the very least, each subtopic listed in the introduction should be contained in a specific paragraph.
- The essay should be written in complete, grammatically correct sentences, with minimal typographic errors

Grade calculation:

With diligent work, it is possible for every student to attain an A in this class. Letter grades will be assigned based on the following scale. Standard rounding will be used, with final scores rounded to the nearest integer percentage, such that a 69.4 would be a D+ and a 69.5 a C-.

100-97% A+	96-94% A	93-90% A-
89-87% B+	86-84% B	83-80% B-
79-77% C+	76-74% C	73-70% C-
69-67% D+	66-64% D	63-60% D-
<60% F		

Appeal of grades

You may appeal your grade on any exam prior to the posting of final course grades. In this as in all college courses, you should retain all graded items until proper grades have been recorded on your transcript.

CORE/GED

This class does not fulfill CORE or GED requirement.

Expectation of students

Prerequisite knowledge

GEOL 412 is an upper level course designed for students pursuing a major in Science, and having already a good understanding of geology. For that reason, a mid-level course in Geology (either GEOL340 or GEOL341) is required

We will derive several mathematical relations and describe their usage in Earth sciences. Although it is not required, familiarity with calculus and differential equations will be helpful.

Academic integrity

The Student Honor Council observes that:

The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation,

and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit <http://www.shc.umd.edu>.

To further exhibit your commitment to academic integrity, remember to sign the Honor Pledge on all examinations and assignments: "I pledge on my honor that I have not given or received any unauthorized assistance on this examination (assignment)."

You are expected to take the Student Honor Pledge
<http://www.studentconduct.umd.edu/aca/honorpledge.html>

I pledge on my honor that I have not given or received any unauthorized assistance on this assignment/examination

Readings

Readings from the textbook or other appropriate resource complement the lectures. Students are encouraged to read and try to understand the material before the class so that there can be better discussion. Any reading material will be available as copies or in electronic form through ELMS.

Attendance

Attendance to the lectures is highly recommended, as provided by University Policy: *"The University expects each student to take full responsibility for his or her academic work and academic progress. The student, to progress satisfactorily, must meet all of the requirements of each course for which he or she is registered. Students are expected to attend classes regularly, for consistent attendance offers the most effective opportunity open to all students to gain command of the concepts and materials of their courses of study."*

The full attendance policy is available at www.testudo.umd.edu/soc/atedasse.html. It provides several cases for which student absence is excused. Any request to be excused must be submitted in writing and with appropriate documentation.

If the campus is closed for any reason during a scheduled lecture, the material of that day will either be incorporated with future lectures or left as reading in the textbook.

Electronic devices

To avoid unnecessary distractions during lectures, use of cell phones, including texting, is allowed only in case of emergency. If you choose to use a computer to take notes, do so in a manner that does not distract other students. You may have to stop if, for example, people around you start to look at your screen instead of the lecture. Text messaging is forbidden at all time during the lectures.

Class evaluation

Every student for any class in which more than five students are registered is expected to complete a course evaluation using the [CourseEvalUM](#) system. This is YOUR chance to anonymously evaluate this class. Please use it!

From November 26 to December 12, 2012, [CourseEvalUM](#) will be open for students to complete their evaluations for Fall 2012. Students can go directly to the <http://www.courseevalum.umd.edu> website to complete their evaluations. You will be alerted via your official University account. Students who complete evaluations for all of their courses in the previous semester (excluding summer), can access the posted results via Testudo's CourseEvalUM Reporting link for any course on campus that has at least a 70% response rate.

If less than 5 students are registered for either GEOL412, class evaluations will be conducted as an anonymous survey on ELMS.

If you feel this course was outstanding, you may want to consider nominating your instructor for *Dean's Award for Excellence in Teaching* in the College of Computer, Mathematical and Physical Sciences. That award is given to one faculty member each year who demonstrates outstanding qualities as a teacher. Candidates are nominated by students. For information, call extension 5-2677.

If you have any issue with the class, I would appreciate you contact me so that we discuss and hopefully resolve it.

Special Needs

I will make every possible effort to accommodate your request for special accommodations, when justified. However, any requests must be submitted as soon as possible and no later than the end of the schedule adjustment period. *Do not wait!*

Students with Disabilities

If you have a documented disability, you should contact Disability Support Services at Susquehanna Hall (<http://www.counseling.umd.edu/DSS/>). Each semester, students with documented disabilities should apply to DSS for accommodation request forms, which you can provide to your professors as proof of your eligibility for accommodations. The rules for eligibility and the types of accommodations a student may request can be reviewed on the DSS web site. Please provide evidence of eligibility before the end of September

Religious Observances

The University System of Maryland policy provides that students should not be penalized because of observances of their religious beliefs, students shall be given an opportunity, whenever feasible, to make up within a reasonable time any academic assignment that is missed due to individual participation in religious observances. *It is the responsibility of the student to inform the instructor of any intended absences for religious observances in advance.*

Schedule

Note: the schedule is always subject to change, depending on how each lecture goes, and on possible University closing. A detailed and updated schedule will be posted on the ELMS website, syllabus section

The tentative schedule is as follows:

September 10: The inner solar system

September 17: Inside the planets

September 24: Surface compositions

October 01: Cratering processes

October 08: Surface ages

October 15: Topography and flexure

October 22: Tectonic structures

October 29: Volcanism

November 05: Thermal Evolution

November 12: Water

November 19: Atmosphere and Climate

November 26: Regolith and weathering

December 03: Conflict with AGU*

December 10: Astrobiology

**Because of scheduling conflict with AGU, the students are required to attend two Department of Geology colloquia on November 09, 2012 (Nancy Chabot, JHU/APL) and November 30 (Lori Glaze, NASA Goddard Space Flight Center).*

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