

GEOL 112 & GEOL 113: Voyages to the Terrestrial Planets and Lab Syllabus – J-term 2014

Instructor: Nick Lang, Ph.D.

Office: Zurn 205 B

Office Hours: M-F 2-2:30

T 3:45-4:45 pm

& by appointment

Phone: 824-3646

Lecture: 9:00 – noon M-F in Zurn 11

Lab: 1-2 pm M-F in Zurn 11

Textbook: None – readings will be provided via internet

Lab book: None (Labs will be provided via Blackboard)

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Course Description:

Voyages to the Terrestrial Planets deals with the origin of the inner Solar System. We will pay special attention to the processes affecting planetary bodies, as well as our motivations and methods for exploring and visiting those bodies.

Prerequisites:

No previous courses are required.

Course Introduction:

Understanding the realm that exists beyond our own blue planet has fascinated people for well over 2000 years. However, it is really only within the past 60 years that our understanding of outer space has really taken off (no pun intended). Our knowledge of what makes up our solar system and how it originated has grown exponentially over the past several decades and will continue to increase in such a fashion for many years to come. Exploring outer space is now a mainstay in our society and it is going to become more and more important as we tackle such issues as global warming, overpopulation, and dwindling natural resources. Therefore, I want my students in the class to become educated citizens regarding the planetary sciences. To get you to that point of being educated citizens, this course is divided into four learning objectives, which are listed below:

Learning Outcomes	Learning Objectives	Assessment
Effective Communication	1) Using oral and written means, articulate the methodologies and motivations for exploring other planets	-Group presentation evaluated by rubric -Discussions evaluated by checklist -Written exams evaluated by answer key
Research and Information Literacy	2) Evaluate the accuracy of scientific information portrayed to the public	-Group presentation evaluated by rubric -Discussions evaluated by checklist -Homeworks evaluated by answer key -Written exams evaluated by answer key
Quantitative and Scientific Reasoning	3) Using scientific data, evaluate factors and processes affecting objects in the solar system past, present, and future	-In class quizzes evaluated by answer key -Written exams evaluated by answer key -Homeworks evaluated by answer key -Discussions evaluated by checklists
	4) Using scientific data, evaluate the requirements for life to exist on other worlds (including what is necessary for human habitation on those bodies)	-Group presentation evaluated by rubric -Discussions evaluated by checklist -Written exams evaluated by answer key

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In addition, in keeping with the school’s mission and heritage with the Sister’s of Mercy, this class aligns itself with the University’s core value of being **Globally Responsible**. In keeping with this core value, by the end of this course *you will have demonstrated an awareness of humans’ critical responsibility to be successful stewards of Earth’ resources as well as Earth’s proper context in the solar system*. You will be assessed on meeting this core value through 1) discussions that will be evaluated by checklists and 2) a group presentation that will be evaluated on a rubric. The course’s tie to the University’s core value is summarized in the table below:

University Core Value	Objective	Assessment
Globally Responsible	You will demonstrate an awareness of humankind’s critical responsibility to be successful stewards of Earth’s resources as well as Earth’s proper context in the Solar System	-Discussions that will be evaluated by checklists -A group presentation evaluated on a rubric

Expectations: How to do well in this class...

For most of you, this will be your first formal exposure to geology and for some of you, this may be your first, and maybe only, experience with science at the college level. I want you to enjoy this class, but expect to be challenged as a student. There is nothing inherently ‘easy’ about the field of geology or this course, but I think if you follow my guidelines for success, you will enjoy this class.

Guidelines for success

Attend all lectures and labs and be respectful of your classmates and myself. If an absence is foreseeable, you need to contact me BEFORE missing class or lab.

Ask questions during class and participate in lecture. Do not be afraid to ask questions. I’ll frequently ask for responses from the class – don’t be shy, speak up and be heard. I don’t expect you to always know the right answer, but I do expect you to try.

Stay organized. My syllabus is very detailed, and I will try my best to keep on schedule. Due dates for all homework, and all test and quiz dates are provided.

Visit me during office hours or after class. Do not hesitate to come by to see me during office hours if you have questions or concerns about anything regarding class or if you just want to say hello. One of the greatest advantages of a school like Mercyhurst is your accessibility to your professors – TAKE ADVANTAGE OF THESE OPPORTUNITIES. I am here for you; you are not taking away my time by coming to office hours – that is why I have them. My office is Zurn 205 B.

Students with a disability: In keeping with college policy, any student with a disability who needs academic accommodations must call the Learning Differences Program secretary at 824-3017, to arrange a confidential appointment with the director of the Learning Differences Program during the first week of classes.

Class Schedule

I will do my best to follow this schedule, but may need to make modifications, which will be announced in class. You are responsible for all announcements made and materials provided during the scheduled class time. If you plan to miss class, send me an email, then follow up with a short visit after class or during my normal office hours to clarify any material you missed.

Date	Topic	Reading
1/7	<p>Course introduction/Origin and geography of the Solar System/What is science?/Citizen science assignment/Term project</p> <p style="text-align: center;"><i>In class assignments:</i></p> <p style="text-align: center;">1) <i>Geography of the Solar System</i> 2) <i>Terrestrial planet surfaces</i></p> <p style="text-align: center;"><i>Organize yourself into groups for term project</i></p>	TBD
1/8	<p style="text-align: center;">Geology of the Earth</p> <p style="text-align: center;"><i>In class assignments:</i></p> <p style="text-align: center;">1) <i>Deriving plate tectonics</i> 2) <i>Rates of Earth processes</i></p> <p style="text-align: center;"><i>Begin organizing your term project mission</i></p>	TBD
1/9	<p style="text-align: center;">Planetary processes</p> <p style="text-align: center;"><i>In class assignment:</i></p> <p style="text-align: center;">1) <i>Volcanism</i> 2) <i>Impact cratering</i></p> <p style="text-align: center;"><u>Term project check point 1: Team and mission outline due</u></p>	TBD
1/10	<p style="text-align: center;">How we interpret planetary surfaces/The Moon</p> <p style="text-align: center;"><i>In class assignments:</i></p> <p style="text-align: center;">1) <i>How we interpret planetary surfaces</i> 2) <i>Moon geography and Moon phases</i></p> <p style="text-align: center;">Class assignment log 1 due</p> <p style="text-align: center;">Quiz 1</p> <p style="text-align: center;"><u>Term project check point 2:</u></p>	http://www.space.com/55-earths-moon-formation-composition-and-orbit.html

	<u>Must have rocket materials</u>	
1/13	The Moon and Mercury	TBD
1/14	Mars	TBD
1/15	Mars <u>Term project check point 3:</u> <u>Rocket must be built</u>	Discussion paper 1
1/16	Venus	TBD
1/17	Extraterrestrial life/Planetary atmospheres <u>Term project check point 4:</u> <u>Launch rocket?</u> Quiz 2	Discussion paper 2
1/20	No Class – MLK DAY	TBD
1/21	Work on term project	-
1/22	Work on term project	-
1/23	Work on term project	-
1/24	Term projects due: <i>Group presentations</i> <i>Papers due</i> Citizen Sci reflection paper due Quiz 3	-

Grading Scale

Coursework

Quizzes (3 @ 25 pts.)	75
Atmosphere Assignment	25
Citizen scientist project	50

Points

Lecture Grade Breakdown

279+ = A
264-278 = B+
240-263 = B

Class Participation	20	231-239 = C+
Paper discussions (2 @15)	30	210-230 = C
Homework log	100	201-209 = D+
Total:	300	180-200 = D
		<180 = F

		<u>Lab Grade Breakdown</u>
Rocket lab	100	93+ = A
		88-92 = B+
		80-87 = B
		77-79 = C+
		70-76 = C
		67-69 = D+
		60-66 = D
		<60 = F

Note that the Lecture and Labs are graded separately
Lecture (GEOL 112) is a 3-credit course and lab (GEOL 113) is a 1-credit course.

Course Activities

In class exercises: As an additional and different means of helping you learn the course materials, we will do a series of in class exercises. When some of these activities will be performed in class is marked on the class schedule above. These activities will not be turned in for credit, but the lessons learned from these activities will appear on the exams. You will typically work in groups on these exercises and then one or more groups will present their results to the rest of the class; the hope is that this will lead to some discussion regarding the covered topic. I don't expect every group to get the same answer nor do I expect every group to always get correct answers. However, I do expect you to always try your best on these exercises.

Labs: Remember that the lab and lecture sections of this course are separate and will be graded separately. That said, there will be considerable overlap of the material covered in each. The purpose of the labs is to provide you with a very hands-on way of learning the material. Lab will routinely make use of various planetary data sets and methodologies. You can either work on your own or in groups for your labs, but **YOU WILL EACH NEED TO TURN IN YOUR OWN ASSIGNMENT**; for your rocket lab, you will need to work in groups of three. With the exception of your rocket lab, all labs will be due at the end of the lab period; your rocket lab is due on January 24th at the beginning of the lecture period.

Rocket presentations: The last class period is reserved for student presentations. I will hand out more detailed information soon, but you and your rocket group will be responsible for designing a theoretical mission to a planetary object, putting together a handful of powerpoint slides, and then giving a short 20 minute presentation to the rest of the class on your topic that will include the data you collected from your launch. The hope is that we can spur some discussion regarding how planetary missions are selected and designed and what it actually takes to oversee one.

Citizen Scientist: As a way to help you to overcome any 'science anxieties' you may have (and as a way to get you excited and 'geeked out' about science in your everyday life), you will be responsible for undertaking a project as a citizen scientist. Opportunities for your projects can be found at the following webpage: <https://science.nasa.gov/citizenscience>

More details will be coming soon about project specifics, but you will be required to put a certain number of hours into the project and you will be required to write a 2-3 page reflection paper on your topic. The reflection paper will be due on the day of your final.

Course Policies

Grading:

Quizzes: For quizzes, the number of points that each question is worth will be listed next to the question; partial credit may be given for a question. There are three scheduled quizzes and all three will count towards your final grade.

Papers and class discussions: You will be assigned two additional papers during the term that you will need to read and on which you will write a one-page summary; the papers will be posted for you on Blackboard and you must be ready to discuss the paper on the appropriate day listed in the course schedule. In the summary you will address the major points discussed by the author(s). You will need to bring two copies of your summary to class: One that you will turn into me at the beginning of class and the other you will keep to help you with discussing that paper in class that day; you are each required to significantly contribute to the class discussion on the paper. You must bring copies of the summary to class on the appropriate day otherwise you will not be allowed to participate in class that day; in addition to losing points for not completing the assignment, not participating in the discussion will count against your class participation grade. Each paper summary (and associated discussion) is worth 15 points. A breakdown of how I will grade this assignment is as follows:

13-15 pts.: Summary fully addresses all of the major points discussed by the author(s), student effectively demonstrates in their writing a comprehensive understanding of what the author(s) is/are trying to say. Student also effectively communicates these points during the class discussion.

11.5-12.9 pts.: Summary addresses all of the major points discussed by the author(s), but the student's writing does not demonstrate a complete and thorough understanding of the paper's major points; some points may not be fully understood by the student. Student demonstrates a good ability to communicate their points during the class discussion.

9.5-11.4 pts.: Summary addresses most of the major points discussed within the paper and they are adequately communicated in the written word; some of the paper's points do not seem to be fully understood by the student. The student modestly communicates their points to the rest of the class during the class discussion.

7.5-9.4 pts.: The summary addresses most of the major points discussed within the paper, but they are only modestly to fairly communicated in the written word; many of the paper's points do not seem to be understood by the student. The student does a fair to OK job communicating their points to the class in the class discussion.

6-7.4 pts.: The summary addresses some of the points discussed within the paper and they are poorly communicated in the written word; most to none of the paper's points seem to be understood by the student. The student does a poor job participating in the class discussion on the paper or does not participate in the discussion.

5 pts. and less: The student failed to complete the assignment or did not understand ANY aspect of the assigned reading. The student did not participate in the class discussion.

Homework logs: Specific questions on homeworks will not be worth specific numbers of points. Instead, I will be reading through your homework logs to gain a feel as to how well you understand the course content. When you receive your log back, you will not have points listed for you, but rather a check, check plus, check minus; a check plus means excellent work, a check means good to average work on the questions, and a check minus means that you did the work, but your quality of questions needs improvement. This will translate to points at the end of the term where turning in all of the assignments will earn you 50 of the 100 available points for this portion of the class. Have a majority of check plusses on your work will earn you the full 100 points whereas having a majority of checks on your work will earn you a total 85 points, and having a majority of check minuses will earn you a total of 65 points. Being split between check types will earn you point totals in between those just listed above.

Late work: Assignments will routinely be due at the end of class on the due date listed above in the class schedule and, similar to the ‘real world’, deadlines must be kept. Therefore, ANY ASSIGNMENT NOT TURNED BY THE END OF CLASS ON THE DAY AN ASSIGNMENT IS DUE IS LATE. Late assignments will be marked off a full point for every *day* they are late. If you know that you will not be able to turn in an assignment on time for whatever reason, you need to come talk to me immediately.

Class disruptions: You are all considered mature and legal adults who all deserve treatment with respect. Therefore, I expect you all to treat each other and myself with respect. This means that cell phones should be turned off or at least silenced during class, you should not be disrupting your class neighbors with continual chatter and/or texting, and you should be in your seat ready for class by the time class is scheduled to begin. I realize that sometimes that there are the occasional occurrences where a student will be late and I sympathize with that, but continual tardiness and continual disruption of the class will not be tolerated and continual violators will be asked to leave for the rest of the class period.

Academic honesty: As I mentioned above, there is nothing inherently ‘easy’ about this course. Therefore, I don’t expect you to always get the right answer. However, I do expect your answers and your work to always be your own. I encourage you to work together on homeworks and labs, but you always need to turn in your own work that is in your own words. Work that is turned in and seems to be an exact duplicate of someone else’s work constitutes plagiarism on both individuals regardless of whose work was the original. In addition, if you are using some external source such as your textbook, a magazine or journal article, or the internet to help you with your work, you MUST CITE that work. Not citing that work also constitutes plagiarism. A first offense of plagiarism in this class will earn you a 0 (zero) on that assignment. A second offense will constitute an automatic F in the course. If you have questions or concerns regarding this policy, please feel free to come talk to me at any time.

Finally and I can never stress this enough, but IF YOU EVER HAVE ANY QUESTION ON ANYTHING REGARDING THIS COURSE, PLEASE ALWAYS FEEL FREE TO COME TALK TO ME ABOUT IT. THIS GOES FOR ANYTHING REGARDING ANYTHING; PLEASE ALWAYS FEEL FREE TO COME TALK TO ME ABOUT ANY ISSUES.