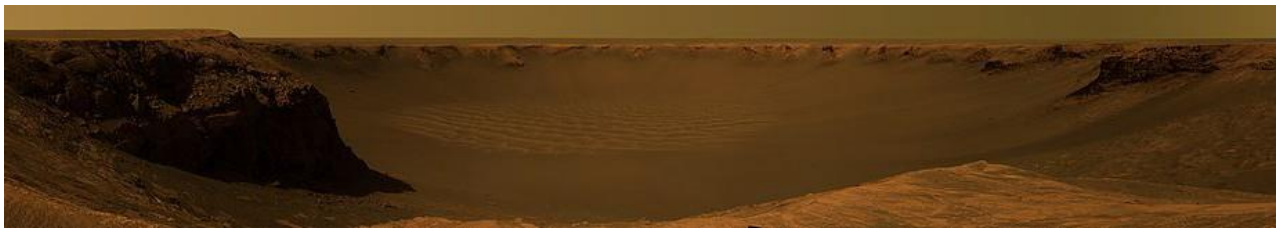
Earth Sciences 2232G: Exploring the Planets

An Introduction to Planetary Science



Victoria Crater, Mars. Taken by the NASA rover "Opportunity"

******This course is taught as a fully online format******

NOTE: THIS SYLLABUS IS SUBJECT TO CHANGE

Section:	**Lectures:**
Section 650	under construction
Section 651	under construction
Section 652	under construction

Laboratories:	All online
Instructors:	Dr. Nigel Blamey and Dr. Dazhi Jiang
Office:	Room 1000, Biological & Geological Sciences Building
Office hours:	Mondays 09:30–10.15, Wednesday 11.30–12.30 (or by appointment)
Email:	nblamey2@uwo.ca
Phone:	(ext. 85246 on campus)
TAs:	to be announced
Prerequisites:	None, but skills of WORD, EXCEL and POWERPOINT are assumed
Antirequisites:	None
Textbook:	There is no required textbook for this course. Material will be presented online in various formats. There are abundant online resources for this course, including *Exploring the Planets* by E. H. Christiansen & W. K. Hamblin), which is freely available online at http://explanet.info/

Course Calendar Description:

This course provides an introduction to planetary science and the exciting frontier of space exploration. Emphasis is placed on exploring the processes that shape the planets and moons of the Solar System and how this informs us about the origin and evolution of Earth, the Solar System, and of life itself. Advances in planetary science are highlighted with particular attention to recent and current results from planetary exploration missions.

Detailed Course Description:

This course provides an introduction to the interdisciplinary field of planetary science, which can be defined as the scientific study of planets, moons, and planetary systems. This course explores the origin and development of the Solar System with an emphasis on what is presently known about the Solar System and its constituents, with particular emphasis on the terrestrial (or rocky) planets – Mercury, Venus, Earth, and Mars – and the Earth's moon. Students will be introduced to the major processes that shape the interior and surface of rocky planets and moons, as well as the processes that affect the atmospheres of the terrestrial planets and the giant planets of the outer Solar System. This course seeks to highlight the exciting nature of planetary science and the rapid pace of discoveries. The results of recent and ongoing space missions to various planets and moons will be integrated into the lecture material. Guest lectures from researchers participating in planetary missions may be incorporated. The goal of this course is to enhance students' understanding of how our Solar System formed, the processes that shape the planets and moons of the Solar System, and implications this has for the origin and evolution of Earth and of life itself. This course will focus on the following topics:

- Why do we explore Space? What is planetary science?
- The properties of planetary bodies in the solar system.
- The origin of the solar system.
- Planetary interiors.
- Planetary surface processes (e.g., volcanism, impact cratering, aqueous processes).
- Planetary atmospheres.
- Meteorites: rocks from Space.
- Astrobiology and the search for life.
- Exoplanets: Extending planetary science beyond our Solar System.

Learning Outcomes:

Upon completion of this course successful students will be able to:

- Define the properties of the various objects in the Solar System.
- Distinguish and explain processes that shape the various objects in the Solar System.
- Apply knowledge of the Solar System's dynamic processes to develop a targeted space exploration project.
- Integrate theoretical and observational information to describe the cause(s) of the variety of objects in our solar system.
- Evaluate and begin to synthesize concepts, theories, and observations related to course material.
- Develop writing skills and project development related to planetary science and space exploration.

Course Materials:

The majority of the materials for this course will be presented online through pre-recorded lectures, tutorials, and laboratories.

Course Evaluation (summary):

Laboratory Exercises	30% (3x10%)
Quizzes	30% (6x5%)
Individual Report	25%
Group Project Poster	15%
Total	100%

Course Evaluation (details):

Important note: the poster will be carried out in groups. You **MUST** sign up for groups in OWL; deadline will be announced via a global e-mail. Parts of the OWL site are under construction so please check regularly that the signup works.

Laboratory Exercises – Three online laboratory exercises will cover a variety of topics, including impact cratering of planetary surfaces, investigation of major rock types common to many planetary surfaces, exoplanets, etc. Full details for each lab are provided in the Online Laboratories tab in OWL. The laboratory exercises are submitted through the Assignments tab. Due dates for each lab will be posted on OWL.

Quizzes – you are required to take a series of quizzes throughout the course. Due dates for each quiz are posted on OWL. You are responsible for ensuring that you have reliable internet connection to take the quizzes. Once started, you have a limited time in which to complete a quiz. We suggest that you save frequently as you go along in case you experience an issue.

Individual Assignment – Mission beyond Earth – Under construction. In this assignment, you are required:

1) To work together in *groups* of 6 people to review a mission which we will call *"Mission beyond Earth"*. The group will review a previous or current mission by a country that has a space exploration capability, such as NASA or other. Examples could be Cassini, Voyager, Hubbel Telescope, Apollo, Curiosity, or any other space mission that looks outwards beyond Earth. Please draw on the information from a literature review. Detailed requirements for this group project will be announced at a future date.

2) To write a report *individually*. The report gives a clear and complete description of the reviewed mission. The report must have a minimum length of 2500 words excluding references to fulfill the requirement for an essay course. **Do NOT share your report with others in your group**!

Group Project Presentation – Under construction. The finale for this class will be a poster by each group in the final two weeks of the semester. Posters should be 36" high by 48" wide and a template for compiling the poster in PowerPoint will be provided. Posters and presentations will be evaluated by the professors and TA's.

Course Polices and Friendly Reminders:

Assignments: All assignments must be submitted via OWL on the assigned due date and will not be accepted late, except under medical or other compassionate circumstances (see below); after the due date a penalty of minus 5 marks per day will be applied. No assignment without appropriate

documentation will result in a zero (0) grade. Students must write their assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge this both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence (see below).

Accessibility: Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.

Absences/Missed Exams/Assignments: If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to the Dean's office as soon as possible and contact your instructor immediately. It is the student's responsibility to make alternative arrangements with their instructor once the accommodation has been approved and the instructor has been informed. There is no final exam.

A student requiring academic accommodation due to illness should use the Student Medical Certificate when visiting an off-campus medical facility or request a Records Release Form (located in the Dean's Office) for visits to Student Health Services. The form can be found here: https://studentservices.uwo.ca/secure/medical_document.pdf

Academic misconduct: Academic Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf

All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (http://www.turnitin.com). Computer-marked tests and may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

Classroom Behaviour: Disruptive behavior will not be tolerated in class or on the course website. Please respect the rights of your classmates to benefit from the lecture by limiting your conversations to those essential to the class. Students who persist in loud, rude or otherwise disruptive behavior will be asked to leave. Cellular phones, pagers, and text-messaging devices are not to be used in class and must be placed in silent mode. Laptops for the purpose of typing lecture notes are permitted in class, but

please be respectful to your fellow students and turn the sound off. Audio and/or videotaping of lectures is not permitted unless approval has been sought from the instructor in advance.

Grades: Course marks may, in some cases, be adjusted in order to conform to the meaning of course marks described in the Western Academic Calendar, http://www.westerncalendar.uwo.ca/2014/pg104.html, and in order to conform to Department policy

Support Services: Students who are in emotional/mental distress should refer to Mental Health@Western http://www.uwo.ca/uwocom/mentalhealth/ for a complete list of options about how to obtain help. Other support is available from Registrarial Services (http://www.registrar.uwo.ca) and Student Support Services (http://westernusc.ca/services/).