PS9603A: Introduction to Planetary Science

FALL 2020

Presented by the Department of Earth Sciences and Department of Physics and Astronomy

As part of the Collaborative Graduate Program in Planetary Science

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Lead Instructor: Dr. Catherine Neish
E-mail: cneish@uwo.ca

Lectures: August 31 – September 6, 2020, 9:00 am – 5:00 pm
Location: Online (*link will be sent to registered students*)

Prerequisites: No specific prerequisites are required, but previous enrollment in at least one Earth Science or Planetary Science course is generally required. Please speak to the instructors if you have any concerns or are seeking an exception.

Course Description

This is an intensive 7-day short course for graduate students, researchers, industry and government employees on planetary science. **This course is mandatory for all new planetary science graduate students at Western and should be taken during the first year.** The focus of the course will be on the fundamental processes that have shaped the planets, their moons, and asteroids and comets. Some of the world's leading experts on planetary science will present half-day modules on selected topics. The course is suitable for advanced undergraduate students, graduate students. and professionals from industry and government. The course will feature both overview lectures on background theory, smaller topical study groups, as well as hands-on activities involving imagery returned from robotic orbiters and landers. Recent and ongoing planetary missions will be highlighted. The course is intended to provide the non-specialist with a working knowledge of the multidisciplinary fields within planetary science.

Course Schedule

Date	Day	Topics/Modules
Aug. 31, 2020	Monday	**Lecture 1:** Welcome and Course Introduction (C. Neish) **Lecture 2**: Small Bodies (M. Campbell-Brown) **Lecture 3**: Solar System Formation (P. Weigert)
Sept. 1, 2020	Tuesday	**Lecture 4:** Planetary Surfaces (C. Neish) **Lecture 5**: Astromaterials (R. Flemming)
Sept. 2, 2020	Wednesday	**Lecture 6:** Planetary Data Sets (C. Neish) **Lab 1**: Introduction to JMARS (L. Tornabene)
Sept. 3, 2020	Thursday	**Lecture 7:** Planetary Atmospheres (P. Brown) **Lab 2**: Landing Site Selection (C. Neish)
Sept. 4, 2020	Friday	**Lecture 8:** Astrobiology (C. Neish) **Lecture 9**: Exoplanets (S. Metchev)
Sept. 5, 2020	Saturday	**Lab 3:** Atmospheres of Icy Moons (C. Neish) **Team Projects:** Group research preparation time.
Sept. 6, 2020	Sunday	**Student presentations:** Presentations start at 9:00 am

Detailed Time Table

9:00 – 10:30 am	Lecture and Quiz*
10:30 – 10:45 am	Break
10:45 – 12:00 pm	Lecture
12:00 – 1:30 pm	Lunch break
1:30 – 3:00 pm	Lecture
3:00 – 3:15 pm	Break
3:15pm – 5:00 pm	Lecture

**Quizzes will be held on Sept. 1 – 4. Details on quizzes are given below.*

Course Materials

To participate in this course, you need a computer with (a) access to the Internet, (b) a working camera and microphone, and (c) a copy of Zoom installed (https://zoom.us/download).

You will also need to download one software package in advance of the class:

1. **JMARS** is a free planetary GIS package, which provides instant access to planetary data for almost every object visited by spacecraft in our Solar System. It is highly recommended that you download from this link (https://jmars.mars.asu.edu/download). Extensive tutorials for visualizing planetary datasets, and some basic instructions on data manipulation, can be found here: https://jmars.asu.edu/jmars-tutorials.

Course Evaluation and Course Credit:

This one-week course is worth 0.5 FCE credit. Students registered in the course will be evaluated as follows:

Course component	Notes	Value
In Class Quizzes*	Quizzes will be held on **Sept. 1, 2, 3, and 4**. Each quiz is worth 5% of the course grade. Quizzes are open book.	20%
Laboratory Exercises	Three lab exercises, each worth 10% of your grade, will be assigned throughout the course. These assignments are due on **November 13, 2020** at 5:00 pm. Please send them to the course instructor, C. Neish (cneish@uwo.ca).	30%
Group Project	Groups of ~4 students will design a space mission together. Please see the Group Project description in OWL for more details.	50%

**A short quiz will be administered during the first 10-15 min of class. Responses must be uploaded to OWL by 9:30am to receive credit.*

***Special NOTES on course credit*:**

Students from any university are eligible to take the course and may receive credit in their respective institutions, subject to approval from their home Department. If you are a Western student who seeks permission to take this graduate level course (*i.e., its outside your major/program),* you will need to fill out this form to get the relevant approvals to receive a grade in the course:
https://grad.uwo.ca/doc/academic_services/course/course_outside_program.pdf

If you are a non-Western student, but from a University in Ontario, we advise that you use this form https://grad.uwo.ca/doc/academic_services/visiting_exchange/ovgs_form.pdf, and inquire of your home institution if there are any additional steps to take for receiving full-credit for the course. For instructions on submission of this form, please contact Amy Wickham at awickham@uwo.ca.

Academic Honesty Statements and Absences:

Assignments: Assignments must be submitted electronically on the assigned due date and will not be accepted late, expect under medical or other compassionate circumstances (see below). Submitting a late 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). APA style is the approved style of writing for all assignments produced for this course. Please refer to the University of Western Ontario Library webpage for information on citation style and format or consult the APA publication manual: Publication manual of the American Psychological Association (6th ed.). (2009). Washington, DC: American Psychological Association.

Accessibility: Please contact the course instructor if you require material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 519-661-2111 x 82147 for any specific question regarding an accommodation.

Missed course components: If you are unable to meet a course requirement due to illness or other serious circumstances, you must seek approval for the absence as soon as possible. During the COVID-19 pandemic, medical notes are not required. Medical absence can be reported through the *Student Illness Reporting Tool* at

https://www.registrar.uwo.ca/academics/academic_considerations/index.html.

If this portal is not available (i.e., if the COVID-19 pandemic has lifted before the end of the course), or if you have missed (or will be missing coursework) for a non-medical reason beyond your control, approval can be granted either through a *Self-reported Absence* (if the portal is available) or via the Dean's Office/Academic Counselling unit of your Home Faculty. Non-medical reasons must be accompanied by supporting documentation. If you are a Science student, contact information for the Academic Counselling Office for the Faculty of Science is available at https://www.uwo.ca/sci/counselling/.

In all cases, you must contact your instructor as soon as possible, and no later than 24 hours after the period covered, to clarify how you will be expected to fulfil the academic expectations you have missed (unless other instructions are indicated in this Course

Outline). For further information, please consult the University's policy on academic consideration for student absences:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_illness.pdf.

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. Audio and/or videotaping of lectures is not permitted unless approval has been sought from the instructor in advance.