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# PS9603A: Introduction to Planetary Science

**FALL 2023**



*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 28 – September 3, 2023, 9:00 am – 5:00 pm  
**Location:** PAB 148

**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.

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## 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	Location
Aug. 28	Monday	<b>Lecture 1:</b> Course Introduction (C. Neish)	PAB 148
		<b>Lecture 2:</b> Solar System Formation (P. Wiegert)	PAB 148
Aug. 29	Tuesday	<b>Lecture 3:</b> Planetary Atmospheres (P. Brown)	PAB 148
		<b>Lecture 4:</b> Exoplanets (S. Metchev)	PAB 148
Aug. 30	Wednesday	<b>Lecture 5:</b> Astromaterials (P. McCausland)	PAB 148
		<b>Lab 1:</b> Astromaterials (R. Flemming)	BGS 1069
Aug. 31	Thursday	<b>Lecture 6:</b> Planetary Data Sets (C. Neish)	PAB 148
		<b>Lab 2:</b> Introduction to JMARS (L. Tornabene)	BGS 0184
Sept. 1	Friday	<b>Lecture 7:</b> Surface Processes (C. Neish)	PAB 148
		<b>Lab 3:</b> Mars Landing Site Selection (C. Neish)	BGS 0184
Sept. 2	Saturday	<b>Lecture 8:</b> Astrobiology (C. Neish)	PAB 148
		<b>Team Projects:</b> Group research preparation time	PAB 148
Sept. 3	Sunday	<b>Student presentations:</b> Start at 9:30 am	PAB 148

## 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 Tuesday, Wednesday, Thursday, and Friday. Details on quizzes are given below.*

## Course Materials

To participate in this course, I recommend downloading the following 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 <b>Aug. 29, Aug. 30, Aug. 31, and Sept. 1</b> . 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 <b>November 24, 2023</b> at 11:55 pm. Please upload these to the appropriate link on OWL.	30%
Group Project	Groups of ~3 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 handed in 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](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 an equivalent of this form from your home university:

[https://grad.uwo.ca/doc/academic\\_services/visiting\\_exchange/Ovgs%20Form%202016.pdf](https://grad.uwo.ca/doc/academic_services/visiting_exchange/Ovgs%20Form%202016.pdf)

You must also 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 Kristen Harris at [kharri27@uwo.ca](mailto:kharri27@uwo.ca).

### **Academic Honesty Statements and Absences:**

*Assignments:* Assignments must be submitted electronically on the assigned due date and will not be accepted late, except 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. 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* (6<sup>th</sup> 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. Students with disabilities work with Accessible Education (formerly SSD), which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

[https://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/Academic%20Accommodation\\_disabilities.pdf](https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic%20Accommodation_disabilities.pdf)

*Missed course components:* Students who experience an extenuating circumstance (illness, injury or other extenuating circumstance) sufficiently significant to temporarily render them unable to meet academic requirements may submit a request for academic consideration through the following routes:

- (ii) For medical absences, submitting a Student Medical Certificate (SMC) signed by a licensed medical or mental health practitioner to the Academic Counselling office of their Faculty of Registration.
- (iii) Submitting appropriate documentation for non-medical absences to the Academic Counselling office in their Faculty of Registration.

Note that in all cases, students are required to contact their instructors within 24 hours of the end of the period covered, unless otherwise instructed in the course outline.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. **All documentation required for absences must be submitted to the Academic Counselling office of a student's Home Faculty.**

For the policy on Academic Consideration for Student Absences, see:

[https://www.uwo.ca/sci/counselling/procedures/academic\\_consideration\\_for\\_absences/index.html](https://www.uwo.ca/sci/counselling/procedures/academic_consideration_for_absences/index.html)

and for the Student Medical Certificate (SMC), see:

[http://www.uwo.ca/univsec/pdf/academic\\_policies/appeals/medicalform.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf)

*Religious Accommodation:* When a course requirement conflicts with a religious holiday that requires an absence from the University or prohibits certain activities, students should request accommodation for their absence in writing at least two weeks prior to the holiday to the course instructor and/or the Academic Counselling office of their Faculty of Registration. Please consult University's list of recognized religious holidays (updated annually) at <https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>.

*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.