



## Course Information: Winter 2018

*Note: This Course Information sheet is a living document that is sometimes updated with minor changes. Such updates will be announced in class, and the latest version will be posted on OWL. The version number can be found at the bottom of each page. **It is your responsibility to ensure that you have the most recent version of this document.** The information on this handout is specific to this Section. All registered students are expected to have read this course information sheet carefully.*

### Course Description

**Course title:** Astronomy 2232G: *Sun, Earth, Planets*; Earth Sciences 2232G: *Exploring the Planets*

**Description:**

**Astronomy 2232G:** A survey of the contents of the solar system and space science phenomena, with emphasis on processes that are common to planets and solar system bodies. Advances in solar system understanding and space science will be highlighted with particular attention to recent results from space missions and contemporary ground-based observations.

**Earth Sciences 2232G:** An introduction to planetary science and the exciting frontier of space exploration; emphasis is placed on the processes shaping the planets and moons of the Solar System and how this relates to the evolution of Earth, the Solar System, and life; attention paid to current results from planetary exploration missions.

**Prerequisites:** None

**Antirequisites:** ES 2001G, ASTRO 2232G  
0.5 course

**Section:** 650; Distance studies

**TAs:** Shannon Hibbard ([shibbard@uwo.ca](mailto:shibbard@uwo.ca)), Denis Vida ([dvida@uwo.ca](mailto:dvida@uwo.ca))

### Instructor and Contact Information

**Instructor:**

Dr. Elizabeth A. Silber  
Office: off campus  
Phone: (401) 863-3826  
E-mail: [esilber@uwo.ca](mailto:esilber@uwo.ca)

**Office Hours:** Virtual office hours.

**E-mail:** OWL has an e-mail feature that you should use to contact the instructor and/or TA's in this course. Please allow (and expect) 2-3 business days for a reply. Note that OWL mail will not automatically be forwarded to your Western mail account; therefore you should *check your OWL mail status for replies*.

If you use regular Western mail, make sure that you include ES2232G or A2232G in the subject.

E-mails from accounts other than Western mail will NOT be read and/or replied to.

## Course website

All online instructional materials as well as grades for course components will be posted on the secure OWL site. For technical issues accessing this site in general or this course in particular, please check out the information at the ITS website: <http://www.uwo.ca/its/> and contact ITS services if problems persist.

The OWL course website will be the only medium where additional course materials are distributed at the appropriate time; where announcements are made and projects are submitted; OWL is furthermore the means to get access to your marks for various course components. Additionally, there is a course discussion forum, as well as links to useful resources.

You will need to successfully complete a short quiz on the material covered in this outline before you can access the rest of the course material.

## Required course materials

**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/>.

Additional course materials (e.g. lecture notes, slides, movie clips, ...) will be made available on OWL.

## Course overview and objectives

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 will 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 Components, Grades and Requirements

Your final grade in this course is obtained from marks for various course components (explained below) and calculated according to the following scheme:

Course Component	Weight (%)
OWL Course Outline Quiz	1.5%
Pre- and Post-Course Surveys	2.5%
Scientific Engagement	10%
Quizzes	15%
Laboratory Exercises	30%
Group Project Assignment	30%
Group Project Presentation	10%
<b>TOTAL:</b>	<b>100%</b>

The Departments of Physics and Astronomy, and Earth Sciences may, in rare cases, adjust the final course marks in order to conform to Departmental policy.

To pass this course, you need to obtain a final mark of at least 50%. To pass the course, you need to earn a passing grade in the group project (including both the assignment and presentation components).

Grades for various components will be posted on OWL regularly; it is your responsibility to check these grades regularly. Any errors, or appeals to your scores, **must be reported to your instructor within 5 (five) days** of their initial posting.

## Exams

This course does not have exams.

## Pre- and Post-Course Surveys

This takes the form of a short survey in the form of a quiz to gauge students' perceptions and understanding of key concepts and facts in planetary science prior to, and following the completion of, the class. To obtain full marks for this component of the course, both surveys must be completed. There are no right or wrong answers!

## Scientific Engagement

One of the most exciting aspects of planetary science is how rapidly new discoveries are made. As part of this class, students will share relevant news items by "tweeting". Some examples of space news websites and people to follow on Twitter will be provided on the OWL site. Students may use their own personal account or may choose to create a new Twitter account for the purposes of this class. To receive any marks for this assignment, please do the following:

- Submit your twitter handle via the Assignment tab in OWL;
- Follow the official Twitter account for this course at @A2232G – we will share lots of news relevant to this class throughout the semester;
- All tweets **MUST** include the #ES2232 hashtag to be counted;
- Ensure that your tweets are public.

A guide for how tweets will be graded is as follows: 0 tweets = 0 marks; 1–5 tweets = 1 mark; 5–9 tweets = 2 marks; 10–14 tweets = 3 marks; 15–19 tweets = 4 marks; 20–24 tweets = 5 marks; 25–29 tweets = 6 marks; 30–34 tweets = 7 marks; 35–39 tweets = 8 marks; 40–44 tweets = 9 marks; 45 or more tweets = 10 marks. However, the TA's and myself will be closely monitoring these feeds and grading them according to your depth of insight rather than merely the number of Tweets. For example, simply “retweeting” other people’s tweets throughout the semester will not earn you 10 out of 10 marks even if you post 45 times.

For those of you unfamiliar with using Twitter, this is a helpful article:

<https://support.twitter.com/articles/215585>.

For students not comfortable using Twitter, an alternative is to post items to the Forum page in OWL; however, the learning experience will be less that if you use Twitter and the same rubric will apply. Students are, therefore, strongly encouraged to use Twitter.

### On-line Quizzes and Participation

You are required to take series of quizzes throughout the course. Due dates for each quiz are posted on OWL. On-line assessments can be completed at any computer connected to the internet, including at home. Since there will be ample time given between quiz release date and the due date, there will be no make-up assignments.

In order to access the course materials (lectures, etc.) on OWL, you will need to complete OWL Course Outline Test (test will be available on-line until **Friday, Jan 19 at 11:00 pm**). OWL Course Outline Test is worth 1.5% of your total mark. You have unlimited number of attempts and unlimited time to complete the Course Outline quiz.

Participation points can be earned through Scientific Engagement (for further details, see the Scientific Engagement section in this document).

**Note about on-line assessments (quizzes, projects, etc.):** it is your responsibility to ensure that you use a computer with a reliable internet connection. We cannot adjust any marks based on internet connection drop outs or a software/hardware issue. Any problems associated with your OWL account should be directed to ITS ([www.uwo.ca/its](http://www.uwo.ca/its)). It is strongly advisable to start and complete any on-line assessment as early as possible and to avoid waiting until the last minute.

### Laboratory Exercises

Throughout the semester, you will be given the opportunity to complete a number of online Laboratory exercises that are worth a total of 30% of your final mark. The Laboratory exercises will cover a variety of topics, including mapping of planetary surfaces, investigation of major rock types common to many planetary surfaces, etc. Full details for each lab are provided in the Online Laboratories tab in OWL and they are submitted through the Assignments tab. Due dates for each lab are posted on OWL. Each lab is worth 6% of the final mark.

If you complete more projects than required, the projects with the lowest marks will be dropped from the calculation of your final mark. Late projects will not be accepted. Since there are more projects available than needed for full marks, no make-up opportunities will be given for project work. The complete list of all available projects will be distributed during the first week of classes.

### Group Project Assignment - Mission to Mars

In this assignment, you are required to work together in groups to produce a report for a mission concept “Mission to Mars”. Facilitated by an interactive web application, you get to decide what the goal of the mission is, what scientific instruments you need, and where you will land. You will need to draw on the information presented during the course, together with a literature review, to develop a successful mission concept. Detailed requirements for this group project will be provided through the relevant OWL link.

## Make-up policy and extensions for course components

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. In the event of a missed final exam, a "Recommendation of Special Examination" form must be obtained from the Dean's Office immediately. For further information please see: <http://www.uwo.ca/univsec/handbook/appeals/medical.pdf>

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](https://studentservices.uwo.ca/secure/medical_document.pdf)

You should also be aware of the following Senate regulations:

- *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. In the event of a missed final exam, a "Recommendation of Special Examination" form must be obtained from the Dean's Office immediately.* For further information, please see
- [http://www.uwo.ca/univsec/handbook/appeals/accommodation\\_medical.pdf](http://www.uwo.ca/univsec/handbook/appeals/accommodation_medical.pdf).
- *A student requiring academic accommodation due to illness, should use the Student Medical Certificate when visiting an off-campus medical facility or request a Record's 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](https://studentservices.uwo.ca/secure/medical_document.pdf).
- Note that if you fail to write a scheduled Special Examination, permission to write another Special Examination will be granted only with the permission of the Dean in exceptional circumstances and with appropriate supporting documents. In such a case, the date of this Special Examination normally will be the scheduled date for the final exam the next time the course is offered.
- **Group Project:** No make-up opportunity will be offered.
- **On-line Assessments:** No make-up opportunity for any of the course components will be offered. Reweighting will be considered only with documentation validated in the Dean's Office.

## Extensions for Course Components

It is the student's responsibility to ensure that all course work is done in a timely manner. Keeping that in mind, please note that no extensions will be given for any course assessments (projects, participation, etc.) on an individual basis. Any accommodation requests MUST be done through your Dean's Office.

## Academic misconduct

Scholastic Offenses are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offense, at the following web site:

[http://www.uwo.ca/univsec/handbook/appeals/scholastic\\_discipline\\_undergrad.pdf](http://www.uwo.ca/univsec/handbook/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.

It is a scholastic offense to cheat on a test, quiz, assignment or exam, to plagiarize a course project, to modify marked material to falsely justify additional credit. Cheating also includes having available any other electronic

devices than a watch during a test or exam. Committing a scholastic offense is attended by academic penalty, which may include expulsion from the program. Computer-marked multiple-choice tests and exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating. If you are caught cheating, there will be no second warning. Any student caught engaging in this behavior will (1) receive a mark of zero on the course component in question; (2) receive a mark of zero for their class participation mark, and (3) may be subject to a further, and often quite severe, penalty.

## On-line Conduct

The forums in this course are intended to provide students with an opportunity to ask questions, give comments and learn, and we expect you to respect the rights of your classmates to benefit from the on-line tools by refraining from foul language or any improper behaviour. Disruptive behavior on OWL will not be tolerated.

## 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 661-2111 x 82147 for any specific question regarding an accommodation.

## 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/>).

## Accommodation for Religious Holidays

Please see the link below for the University's policy on for accommodation due to religious holidays.  
[http://www.uwo.ca/univsec/handbook/appeals/accommodation\\_religious.pdf](http://www.uwo.ca/univsec/handbook/appeals/accommodation_religious.pdf)

## Complaints and Suggestions

If you have a concern about something, please let us know. We rely on your feedback. Please contact initially the person most concerned – this will usually be your instructor. If that is not satisfactory, or if there is something more general bothering you, talk it over with the Physics & Astronomy Department Chair or the Associate Chair of Undergraduate Studies (for contact information see <http://www.physics.uwo.ca>).

## Your Grade

Meaning of letter grades:

Letter Grade	Numeric Mark	Meaning
A+	90-100	One could scarcely expect better from a student at this level
A	80-89	Superior work which is clearly above average
B	70-79	Good work, meeting all requirements, and eminently satisfactory
C	60-69	Competent work, meeting requirements
D	50-59	Fair work, minimally acceptable
F	below 50	Fail

You earn your grade for completing course requirements, and for having gained a good knowledge and understanding of the course material. To maximize this grade, you should:

- 1) read the lecture notes on daily basis;
- 2) participate on the forum;
- 3) review past lectures regularly;
- 4) do all of the course labs, quizzes and other assignments on time;
- 5) seek regular help for material that you do not understand;
- 6) **ask questions!**

On average, this should take up about 2-3 hours per each lecture hour. Check the Frequently Asked Questions (FAQs) on the course website and follow discussions on the forum.

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.

If you find that you are falling behind or are having difficulties with the course material, please contact your instructor or a TA immediately.

### **Lecture Topics – Course Content (Winter 2018)**

Lecture topics and schedule are posted on OWL.