GEOL1420 Exploring the Planets - Course Syllabus



Welcome to Exploring the Planets, during this term we will examine the evolution of our Solar System and its constituents. The emphasis will be on comparing the known features and processes on Earth with features seen on other planets, such as Mercury or Mars. We will discuss recent findings from space missions as well as ground-based observations. As we continue to explore the Solar System, we will find that life may not be restricted to our planet.

Course description

Discover the planets of our Solar System. This course will examine the evolution and geological processes of our neighbours. We will use Earth analogues and the latest findings of human planetary exploration to better understand the origin of the Solar System.

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Course Goals

Upon completion of this course you should be able to:

- Understand the basic geology of the Earth and other planets of our Solar System.
- Describe various techniques used to acquire geological knowledge about other planets.
- Identify major differences among Terrestrial and Jovian planets.
- Explain basic concepts of the stellar evolution.
- Express and support you r opinion on the possibility of life beyond the Earth.

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Course materials

Required

Bookstore

The following required materials are available for purchase from the University of Manitoba Bookstore. Please order your materials immediately, if you have not already done so. See your Distance and Online Education Student Handbook for instructions on how to order your materials.

- Textbook
  Chaisson, E. and McMillan, S., 2014. Astronomy Today: The Solar System. 8th ed. Pearson Addison-Wesley.
- Textbook companion website
  www.masteringastronomy.com

Optional

Journals and Web Sites

- *NASA* - http://www.nasa.gov/hom
- *Sky and Telescope* - http://skyandtelescope.com
- *Astronomy* - http://www.astronomy.com/asy/default.aspx
- *SkyNews.ca* - http://www.skynews.ca/
- *National Geographic's Virtual Solar System*- http://science.nationalgeographic.com/science/space/solar-system/
- *Space.com* - http://www.space.com/
- *The Nine Planets* - http://nineplanets.org/
- *ESA* – http://www.esa.int/esaCP/

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Course overview

This course is designed to provide an introduction to the nature and evolutionary history of the Solar System using up-to-date information. The emphasis will be made on processes that are common to planets and other planetary bodies. Students will be introduced to some basic astronomical concepts and ideas, and learn how data are gathered and interpreted from distant planetary bodies. The place of our Solar System in the Galaxy and Universe, and the possibility of life on other planets will be discussed. An overview of the various inter-related systems of Earth, the only celestial body that is known to contain life, will be given during the beginning stage of the course. Students will also learn about the internal structures, geological histories and processes operating on other planets. Information regarding Kuiper Belt objects, smaller planetary bodies (such as asteroids, comets and meteorites) and the nearest star – our Sun will also be presented.

The course is divided into 5 Units

I. Introduction to Planetary Science
II. Earth – our Home in Space
III. Terrestrial (Inner) Planets
IV. Jovian (Outer) Planets
V. Solar System Debris & Our Sun

Learning activities

Each unit will include reading materials from the course textbook, websites, and power-point slideshows. Students will participate in online group discussion regarding current events in space science.

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Evaluation and grading

Students' knowledge of the assigned material will be assessed three ways:

1. Short on-line quizzes given at the end of Units 1 through 4.
2. Bi-weekly participation in the "What's in the news?" online discussion.
3. Invigilated final examination on the material covered in Units 1 through 5.

Distribution of marks

| Evaluation | Percentage |
|---|---|
| Quizzes 1-4 | 40% |
| Participation in discussions | 15% |

| | |
|---|---|
| Final examination | 45% |
| Total | 100% |

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Grading scale

| Letter grade | Percentage grade | Description |
|---|---|---|
| A + | 93-100 | Exceptional |
| A | 86-92.5 | Excellent |
| B + | 79-85.5 | Very Good |
| B | 72-78.5 | Good |
| C+ | 65-71.5 | Satisfactory |
| C | 58-64.5 | Adequate |
| D | 50-57.5 | Marginal |
| F | less than 50 | Failure |

**Note:** All final grades are subject to departmental review.

Plagiarism, cheating, and examination impersonation

You should acquaint yourself with the University's policy on plagiarism, cheating, and examination impersonation as detailed in the General Academic Regulations and Policy section of the University of Manitoba *Undergraduate Calendar*. Note: These policies are also located in your *Distance and Online Education Student Handbook* or you may refer to Student Affairs at http://www.umanitoba.ca/student.

Assignments

**Note:** Detailed instructions about the assignments are found in the assignment folder in your course website.

- Quizzes - will be taken online, consisting of multiple-choice and true/false questions based on the material covered in the unit. There will be 4 quizzes in total, one due at the end of the 1st four units. The quizzes must be taken during the timeframe given on the course schedule. The quiz will be available for 24 hours starting at 12am Winnipeg Central time. Once you have logged in, you will have 30 minutes to complete the quiz. Ensure that you have given yourself enough time to complete the quiz when logging in, as any quiz that is not completed at the end of the 24 hour period (12am the following day) will be submitted automatically. Example: logging in at 11:45pm the day it is due will only give you 15 minutes to complete the quiz before it is automatically submitted at 12am. Chaisson, E. and McMillan, S., 2011. Astronomy Today: The Solar System. 7th ed. Pearson Addison-Wesley.
- “What’s in the news?” Online Discussions will be due by 11:55pm Sunday of every even week (see the course schedule). As part of these online discussions, students are expected to write a short (5-10 sentences) summary of a news article or webpage that focuses on new developments and /or current events in planetary science, space exploration, etc. Information on these topics can be found using the links provided below:
  - http://www.nasa.gov/home
  - http://skyandtelescope.com
  - http://www.astronomy.com/asy/default.aspx
  - http://www.skynews.ca/
  - http://science.nationalgeographic.com/science/space/solar-system/
  - http://www.space.com/

- http://nineplanets.org/
- http://www.esa.int/esaCP/

References to the source(s) used MUST be included in each summary. Grading of "What's in the news?" discussion will be based on timely and appropriate completion.

Student Honesty Declaration

**NOTE:** Students must complete and submit an honesty declaration form before submitting any assignments. Assignments will not be graded until this form has been completed.

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Assignment due dates

Consult your course schedule for the assignment due dates.

Examination

The final exam will be invigilated and include questions on the material covered in Units 1 through 5. Questions will be the same style as those given in the quizzes.

**Note: The final exam will be conducted at the University of Manitoba, Fort Garry campus or at an alternate location off-campus. All students must declare an exam location. The Registrar's Office is responsible for scheduling the final exam. Once finalized, the exam date and time information will be posted on the University of Manitoba Exam site.**

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Distance and Online Education (DE) Student Resources

In your course website there are links for the following:

- Contacting Distance and Online Education Staff
- Distance and Online Student Handbook
- Distance and Online Education Website

Acknowledgements

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