

STUDENT WARNING: This course syllabus is from a previous semester archive and serves only as a preparatory reference. Please use this syllabus as a reference only until the professor opens the classroom and you have access to the updated course syllabus. Please do NOT purchase any books or start any work based on this syllabus; this syllabus may NOT be the one that your individual instructor uses for a course that has not yet started. If you need to verify course textbooks, please refer to the online course description through your student portal. This syllabus is proprietary material of APUS.

SPST361

Course Summary

Course : SPST361 **Title :** Introduction to Planetary Science with Lab

Length of Course : 8

Prerequisites : [leave blank] **Credit Hours :** 3

Description

Course Description:

This course is an introduction to the formation, structure, atmosphere formation, surface evolution, gravitational and magnetic properties of planets. Processes that form planets and act continually to change them (e.g., earthquakes, volcanoes, giant impacts) are discussed, as are natural satellites (moons), rings, and formation of life. Information gained from spacecraft missions is highlighted. In the laboratory component, students will engage in planetary science inquiry using online interactive simulations and data gathered from space missions and ground-based observatories to help reinforce and build upon the concepts presented in the lesson portion of the course.

Course Scope:

The course is eight weeks long and is appropriate for all levels of undergraduate work. Introduction to Planetary Science is an excellent complement to General Education degrees related to Space Studies as well as any program concerned with the Natural Sciences. Assignments and exams will consist of a variety of multiple choice and true/false questions about the reading. No prior knowledge of Astronomy is necessary.

Objectives

The successful student will fulfill the following learning objectives:

-
1. Explain the formation and evolution of the solar system.
 2. Describe the theories for how life formed on Earth.
 3. Describe what a meteorite is, their types and major constituents.
 4. Explain why the study of meteorites aids in the study of the formation of planets
 5. Describe how atmospheres form and the development of a planet's crust
 6. Describe the forces that change a planet's crust over time.
 7. Explain what observation of craters on a planet's surface can tell us about a planet's past.
 8. Describe the formation, content and structure of planetary rings.
 9. Describe the formation and dynamics of planetary satellites.
 10. Describe the gravitational interaction of planetary bodies and laws that govern orbital dynamics
 11. Describe why the gravitational field of a planet is not uniform.
 12. Describe why some planetary bodies have magnetic fields and others do not.
 13. Describe the theories about how planetary magnetic fields form
 14. Propose theories about how a planet may have formed, or about a planet's solar system based on observed properties of a planet.
-

Outline

Week 1: Solar System and Planet Formation Theory Part 1: From Dust to Dinosaurs

Learning Objectives:

- Explain the formation and evolution of the solar system.
- Describe the theories for how life formed on Earth. **Reading assignment:**
 - Fundamental Planetary Science, Chapter 1
 - Fundamental Planetary Science, Chapter 15
 - Fundamental Planetary Science, Chapter 16-16.11 **Assignments:**
 - Forum 1: Introduce Yourself
 - Lab 1 (Due Week 2): Life in the Universe
 - Week 1 Quiz

Week 2: Solar System and Planet Formation Theory Part 2: Clues and Mysteries found in meteorites

Learning Objective:

- Describe what a meteorite is, their types and major constituents.
- Explain why the study of meteorites aid in the study of the formation of planets **Reading**

assignment:

- Fundamental Planetary Science, Chapter 11
- Paper: Formation of Chondrules and CAI's. **Websites:**

-
- IMCA: Meteorite Classifications
 - Planetary Society: Differentiated Meteorites **Assignments:**
 - Forum 2: Theories of Solar System Formation
 - Lab 1 Due
 - Week 2 Quiz

Week 3: Planetary Surfaces and Atmospheres

Learning Objective:

- Describe how atmospheres form and the development of a planet's crust **Reading assignment:**
- Fundamental Planetary Science, Chapter 5
- Fundamental Planetary Science, Chapter 6 **Assignments:**
- Forum 3: Meteorite Classifications
- Lab 3 (Due Week 4): Atmosphere Formation
- Week 3 Quiz

Week 4: Planetary Satellites and Rings

Learning Objective:

- Describe the features of satellites found in our solar system
- Describe the role of tidal forces in the formation of planetary rings
- Describe the properties of planetary rings round in our solar system **Reading assignment:**
- Fundamental Planetary Science, Chapter 10
- Fundamental Planetary Science, Chapter 13 **Assignments:**
- Forum 4: Planetary Surfaces and Atmospheres
- Lab 2 Due
- Mid Term Exam

Week 5: Planetary Geomorphology

Learning Objective:

- Describe the forces that change a planet's crust over time.
- Explain what observations of craters on a planet's surface can say about the planet's past.

Reading assignment:

- Introduction to Planetary Geomorphology, Chapter 2
- Introduction to Planetary Geomorphology, Chapter 3 **Assignments:**

-
- Forum 5: Planetary Satellites and Rings
 - Lab 3, Part 1: Cratering on the Martian Surfaces (Due this week) • Week 5 Quiz

Week 6: Planetary Gravity Fields

Learning Objective:

- Describe the gravitational interaction of planetary bodies and laws that govern orbital dynamics • Describe why the gravitational field of a planet is not uniform. **Reading assignment:**
- Fundamental Planetary Science: Chapter 2
- Paper: The gravity and topography of the terrestrial planets **Assignments:**
- Forum 6: Geomorphology
- Lab 3, Part 2: Cratering on the Martian Surfaces (Due this week) • Week 6 Quiz

Week 7: Planetary Magnetic Fields

Learning Objective:

- Describe why some planetary bodies have magnetic fields and others do not. • Describe the theories about how planetary magnetic fields form **Reading assignment:**
- Fundamental Planetary Science, Chapter 7
- Paper: Planetary magnetic fields: Observations and models **Assignments:**
- Forum 7: What is Planetary Science
- Lab 4: Planetary Orbits (Due Week 8)
- Week 7 Quiz

Week 8: Dream worlds: Planets in Science Fiction

Learning Objective:

- Propose theories about how a planet may have formed, or about a planet's solar system based on observed properties of a planet.

Reading assignment:

- <https://star-name-registry.com/blog/item/top-15-fictional-planets-in-science-fiction#>
- <https://www.discovermagazine.com/the-sciences/10-best-science-fiction-planets>
- <https://www.tor.com/2019/01/31/five-inhospitable-planets-from-science-fiction/> **Assignments:**
- Forum 8: Science Fiction Planets
- Final Exam
- Lab 4 Due

Evaluation

Forums: Participation is mandatory and will count towards the course grade. You are expected to provide a substantial comment of several well-written paragraphs in each session and a similar comment or reflection in reply to at least two other students' contribution. Statements such as "I agree" or "good post" will not count as a reply.

Quizzes: The quizzes are on-line, open-book, and timed. The questions will be multiple choice and true/false.

Labs: Each student will write an independent lab report and submit it into via "assignments".

Final project: Specific information about the final project is posted on "assignments".

Grading:

Name	Grade %
Brief Biography	3.00%
Forum 2	3.00%
Forum 3	3.00%
Forum 4	3.00%
Forum 5	3.00%
Forum 6	3.00%
Forum 7	3.00%
Forum 8	3.00%
Lab 1	6.00%
Lab 2	6.00%
Lab 3 - Part 1	6.00%
Lab 3 - Part 2	6.00%
Lab 4	6.00%
Quiz 1	5.00%
Quiz 2	5.00%
Quiz 3	5.00%
Quiz 5	5.00%
Quiz 6	5.00%
Quiz 7	5.00%
MidTerm	8.00%

Final Exam 8.00%

Total 100.00%

Materials

Various resources from the APUS Library & the Open Web are used. Please visit <http://apus.libguides.com/er.php> to locate the course eReserve.*

- J. J. Lissauer, I. de Pater, *Fundamental Planetary Science: Physics, Chemistry and Habitability*. Cambridge University Press. ISBN 9781107347496
- R. Greeley, *Introduction to Planetary Geomorphology*, Cambridge University Press. ISBN 9781139554121
- Jones, R. & Lee, Typhoon & Jr, H. & Love, S. & Shang, H.. (2000). *Formation of Chondrules and CAIs: Theory VS. Observation. Protostars and Planets IV*.
- Wieczorek, M.A.. (2015). *Gravity and Topography of the Terrestrial Planets*. 10.1016/B978-0-444-53802-4.00169-X.
- Schubert, G. & Soderlund, Krista. (2011). *Planetary magnetic fields: Observations and models. Physics of The Earth and Planetary Interiors*. 187. 10.1016/j.pepi.2011.05.013.

ISBN: ERESERVE NOTE

Course Guidelines

Citation and Reference Style

Attention Please: Students will follow the APA Format as the sole citation and reference style used in written work submitted as part of coursework to the University. Assignments completed in a narrative essay or composition format must follow the citation style cited in the APA Format.

Tutoring

Tutor.com offers online homework help and learning resources by connecting students to certified tutors for one-on-one help. AMU and APU students are eligible for 10 free hours* of tutoring provided by APUS. Tutors are available 24/7 unless otherwise noted. Tutor.com also has a SkillCenter Resource Library offering educational resources, worksheets, videos, websites and career help. Accessing these resources does not count against tutoring hours and is also available 24/7. Please visit the APUS Library and search for 'Tutor' to create an account.

Late Assignments

Students are expected to submit classroom assignments by the posted due date and to complete the course according to the published class schedule. The due date for each assignment is listed under each Assignment.

Generally speaking, late work may result in a deduction up to 10% of the grade for each day late, not to exceed 5 days. As a working adult I know your time is limited and often out of your control. Faculty may be more flexible if they know ahead of time of any potential late assignments.

Turn It In

Faculty may require assignments be submitted to Turnitin.com. Turnitin.com will analyze a paper and report instances of potential plagiarism for the student to edit before submitting it for a grade. In some cases professors may require students to use Turnitin.com. This is automatically processed through the Assignments area of the course.

Academic Dishonesty

Academic Dishonesty incorporates more than plagiarism, which is using the work of others without citation. Academic dishonesty includes any use of content purchased or retrieved from web services such as CourseHero.com. Additionally, allowing your work to be placed on such web services is academic dishonesty, as it is enabling the dishonesty of others. The copy and pasting of content from any web page, without citation as a direct quote, is academic dishonesty. When in doubt, do not copy/paste, and always cite.

Submission Guidelines

Some assignments may have very specific requirements for formatting (such as font, margins, etc) and submission file type (such as .docx, .pdf, etc) See the assignment instructions for details. In general, standard file types such as those associated with Microsoft Office are preferred, unless otherwise specified.

Disclaimer Statement

Course content may vary from the outline to meet the needs of this particular group.

Communicating on the Forum

Forums are the heart of the interaction in this course. The more engaged and lively the exchanges, the more interesting and fun the course will be. Only substantive comments will receive credit. Although there is a final posting time after which the instructor will grade comments, it is not sufficient to wait until the last day to contribute your comments/questions on the forum. The purpose of the forums is to actively participate in an on-going discussion about the assigned content.

“Substantive” means comments that contribute something new and hopefully important to the discussion. Thus a message that simply says “I agree” is not substantive. A substantive comment contributes a new idea or perspective, a good follow-up question to a point made, offers a response to a question, provides an example or illustration of a key point, points out an inconsistency in an argument, etc.

As a class, if we run into conflicting view points, we must respect each individual's own opinion. Hateful and hurtful comments towards other individuals, students, groups, peoples, and/or societies will not be tolerated.

Identity Verification & Live Proctoring

Faculty may require students to provide proof of identity when submitting assignments or completing assessments in this course. Verification may be in the form of a photograph and/or video of the student's face together with a valid photo ID, depending on the assignment format.

Faculty may require live proctoring when completing assessments in this course. Proctoring may include identity verification and continuous monitoring of the student by webcam and microphone during testing.