

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.

SPST630 16

Course Summary

Course : SPST630 **Title :** Planetary and Solar System Studies

Length of Course : 16 **Faculty :** Dr. Kristen Miller

Prerequisites : N/A **Credit Hours :** 3

Description

Course Description:

This course examines the exploration of the solar system with a focus on the methods used to explore the Sun, planets, moons, and small solar system bodies. Special emphasis is also placed on the space environment and its effects on current and future exploration activities. The threat of comet, asteroid, and meteoroid impacts on Earth will also be addressed. This course requires the use of labs from the GEAS project website, which is supported by the NSF, and are used with permission. [GEAS Project Laboratory Exercises](#)

Course Scope:

This course is designed to give the student a firm grounding in the key concepts of astronomy, as they apply to our study of the planets and small bodies in our solar system and the study of extrasolar planetary systems.

Objectives

Upon completion of this course, the student will be able to

- CO1: Appraise the theories of formation for our solar system and for the planets.
- CO2: Use Newton's Laws of Motion and Gravitation, and the laws of conservation as they relate to solar system dynamics.
- CO3: Apply the principles of thermodynamics to understand energy production in Solar System objects.
- CO4: Differentiate between the modes of energy transport in stars as well as solid bodies.
- CO5: Diagram the structure, history, and chemistry of planetary atmospheres.
- CO6: Evaluate the properties that shape planetary interiors and surfaces.
- CO7: Examine the role of magnetic fields in driving dynamic processes in stars and planetary atmospheres.
- CO8: Describe the unique characteristics of the gas giant planets.
- CO9: Compare and contrast the features of the terrestrial planets and the Moon.
- CO10: Differentiate the properties of the ring and moon systems of the outer planets.
- CO11: Distinguish the properties of the meteoroids, asteroids, comets, and dwarf planets in the solar system.
- CO12: Examine the different properties and detection methods of extrasolar planets.
- CO13: Explore the characteristics of life and where it may be found within the Solar System.

Outline

Week 1: Introduction to Planets and the Solar System

Readings

Text Reading:

Fundamental Planetary Science: Physics, Chemistry, and Habitability, chapter 1

Assignment

Introductions Discussion Post

Week 2: Dynamics

Readings

Text Reading:

Fundamental Planetary Science: Physics, Chemistry, and Habitability, chapter 2

Assignment

Week 2 Discussion

Thesis Topic Due

Week 3: Physics and Astrophysics

Readings

Text Reading:

Fundamental Planetary Science: Physics, Chemistry, and Habitability, chapter 3

Assignment

Week 3 Discussion

Lab 1: Parallax Measurements

Week 4: Solar Heating and Energy Transport

Readings

Text Reading:

Fundamental Planetary Science: Physics, Chemistry, and Habitability, chapter 4

Assignment

Week 4 Discussion

Annotated Bibliography Due

Week 5: Planetary Atmospheres

Readings

Text Reading:

Fundamental Planetary Science: Physics, Chemistry, and Habitability, chapter 5

Assignment

Week 5 Discussion

Paper Outline & Thesis Statement

Week 6: Surfaces and Interiors

Readings

Text Reading:

Fundamental Planetary Science: Physics, Chemistry, and Habitability, chapter 6

Assignment

Week 6 Discussion

Week 7: Sun, Solar Wind and Magnetic Fields

Readings

Text Reading:

Fundamental Planetary Science: Physics, Chemistry, and Habitability, chapter 7

Assignment

Week 7 Discussion

Week 8: Giant Planets

Readings

Text Reading:

Fundamental Planetary Science: Physics, Chemistry, and Habitability, chapter 8

Assignment

Week 8 Discussion

Week 9: Terrestrial Planets and the Moon

Readings

Text Reading:

Fundamental Planetary Science: Physics, Chemistry, and Habitability, chapter 9

Assignment

Week 9 Discussion

Submit Full Draft for Peer Review

Midterm Exam

Week 10: Planetary Satellites

Readings

Text Reading:

Fundamental Planetary Science: Physics, Chemistry, and Habitability, chapter 10

Assignment

Week 10 Discussion

Week 11: Meteorites

Readings

Text Reading:

Fundamental Planetary Science: Physics, Chemistry, and Habitability, chapter 11

Assignment

Week 11 Discussion

Peer Review Due

Week 12: Minor Planets and Comets

Readings

Text Reading:

Fundamental Planetary Science: Physics, Chemistry, and Habitability, chapter 12

Assignment

Week 12 Discussion

Lab 3: Mars Meteorology

Week 13: Planetary Rings

Readings

Text Reading:

Fundamental Planetary Science: Physics, Chemistry, and Habitability, chapter 13

Assignment

Week 13 Discussion

Final Paper Due

Week 14: Extrasolar Planets

Readings

Text Reading:

Fundamental Planetary Science: Physics, Chemistry, and Habitability, chapter 14

Assignment

Week 14 Discussion

Week 15: Planet Formation

Readings

Fundamental Planetary Science: Physics, Chemistry, and Habitability, chapter 15

Assignment

Week 15 Discussion

Lab 4: Measuring the Mass of

Jupiter

Week 16: Planets and Life

Readings

Fundamental Planetary Science: Physics, Chemistry, and Habitability, chapter 16

Assignment

Week 16 Discussion

Final Exam (cumulative)

Evaluation

The grading will be based on discussion assignments, lab assignments, a research paper, a midterm, and a final exam.

1. You will be completing four practical laboratory-type assignments (all software-based). Details will be posted in the assignment module. You will do a formal write-up of your results. Each of these will be worth 4% of your course grade.

2. There will be sixteen discussion assignments during the course (including the introductions discussion. Details for each discussion will be in the Discussion Module.

With the exception of formal extensions, discussion assignments will not be accepted more than a week late. The reason for this is that they are intended to be an interactive exercise, and after a week your classmates will all have moved on to the next topic of discussion. In the case of formal extensions (read my late assignment and extension policy, available in the first week's lesson), the interactive portion of the grade (for the responses and replies to questions) will not be available. If you do need to request a formal extension, I would highly suggest getting the discussion assignments done on time (or within a week), and use the extension for the other assignments.

Any direct quotations or paraphrasing must be properly cited, using APA format. I suggest you write your posts in a word processor and then copy and paste to the discussion. This way, you can use whatever

proofreading tools you have. You all have spelling and grammar checkers, use them...but don't rely on them exclusively, make sure you read through your assignments to check for clarity and mistakes the computer can't catch, such as their/there/they're, to/too (and one of my personal favorites: definitely/defiantly). Writing in a word processor instead of the online classroom also prevents losing your post if the website hiccups.

The responses need to be substantive, and include the items listed above, not simply saying "good post" or "I agree."

Please try not to post at the last minute, as this hinders your classmates' ability to do their work on time, and reduces the overall quality of the class discussion. There will be a late penalty for posts made only on the last day of the discussion.

3. There will be one final exam and a midterm in this course. Each will consist of short answer questions and calculations. There is no time limit for the exams; they are open textbook, but you may not use any other text or source (including the internet) or any other person. For short answer questions you are to answer the exam questions in your own words, not those of the book. All answers should be written in complete, grammatically correct sentences. All explanations should be thorough and complete; all work must be shown neatly for calculations.

4. There will be a research paper on a topic of your choosing relating to the material in the course. The topic selected must be approved by the instructor. The paper should represent a thorough, in-depth, quantitative investigation of a specific topic. It should not be a general overview or summary, but rather a "deep dive" into a narrow topic which demonstrates mastery and deep understanding. The paper should include a critical analysis appropriate for a graduate level of study; it should not be simply a presentation of facts.

WRITING EXPECTATIONS

The paper will be graded against the elements listed in the Writing Assignment Rubric. All written submissions must:

- Be typewritten in double-spaced format submitted inside the electronic classroom (unless classroom access is not possible and other arrangements have been approved by the professor).
- Be a **minimum of 15 pages of narrative in length** (filling space with illustrations, lists, charts, etc. will not count toward the minimum length)
- Be Times New Roman (12-point) font
- Be formatted with page margins Top, Bottom, Left Side and Right Side = 1 inch, with reasonable accommodation being made for special situations and online submission variances.
- Be written in formal, scientific style – 3rd person references only!
- Be written in APA format.
- Contain page numbers, a title page, and annotated bibliography
- Be carefully proofread. I expect the paper to be free from spelling, punctuation, grammar, and factual errors. Must include a minimum of eight (8) scholarly (peer reviewed or official technical reports) sources. News sources and general websites are not acceptable sources.

You must complete all assigned tasks to pass the course. Reading assignments for the semester are listed below. Your knowledge of the reading is reflected in your quiz scores and your ability to actively participate in the discussions. Each week's assignments and other information is contained in the "Lessons" area of the classroom. The lesson will step you through the materials for that week.

Grading:

Name	Grade %
Introductions Discussion	1.00 %
Introductions Discussion	1.00 %
Paper	45.00 %
Thesis Topic	1.00
Annotated Bibliography	2.00
Paper Outline	2.00

Peer Review	15.00
Final Paper	25.00
Labs	16.00 %
Parallax Measurements	4.00 %
JMARS: The Moon Lab	4.00 %
Mars Meteorology	4.00 %
Measuring the Mass of Jupiter	4.00 %
Discussions	16.00 %
Week 2: Astronomy Misconceptions	1.07 %
Week 3: Newton's Laws of Motion	1.07 %
Week 4: Traditional Navigation	1.07 %
Week 5: Planetary Atmospheres	1.07 %
Week 6: Telescopes and Light in the News	1.07 %
Week 7: The Parker Solar Probe	1.07 %

Week 8: Planetary Missions	1.07 %
Week 9: Solar System Formation	1.07 %
Week 10: Jovian Moons in the News	1.07 %
Week 11: Women in Astronomy	1.07 %
Week 12: Small Solar System Bodies Exploration	1.07 %
Week 13: Current Research in Planetary and Solar System Studies /Educational Goals	1.07 %
Week 14: Exoplanets	1.07 %
Week 15: Planetary Defense	1.07 %
Week 16: Wrap-Up	1.07 %

Final Exam	12.00 %
Final Exam	12.00 %
Midterm Exam	10.00 %
Midterm Exam	10.00 %

Materials

Book Title: Fundamental Planetary Science: Physics, Chemistry, and Habitability

Author: Jack Jonathan Lissauer and Imke De Pater

Publication Info: Cambridge University Press

ISBN:

Required Course Textbooks

Lissauer, & De Pater, I. (2013). Fundamental planetary science : physics, chemistry and habitability . Cambridge University Press.

Required Readings

NASA Asteroid and Comet Impact Hazards Website. <http://impact.arc.nasa.gov/>

NASA Near Earth Object Program Website. [NEO Basics](#)

[Statement of Dr. John P. Holdren, Director, Office of Science and Technology Policy Executive Office of the President of the United States to the Committee on Science, Space, and Technology United States House of Representatives on March 19, 2013.](#)

[NOVA. Meteor Strike.](#) 2013.

Additional Resources

Links to laboratory materials are provided online in the classroom.

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](https://www.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 15% 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 Discussion

- Discussions 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 discussion. The purpose of the discussions 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.
-

University Policies

[Student Handbook](#)

- [Drop/Withdrawal policy](#)
- [Extension Requests](#)
- [Academic Probation](#)
- [Appeals](#)
- [Disability Accommodations](#)

The mission of American Public University System is to provide high quality higher education with emphasis on educating the nation’s military and public service communities by offering respected, relevant, accessible, affordable, and student-focused online programs that prepare students for service and leadership in a diverse, global society.