

Course Outline of Record

1. Course Code: A-003
2.
 - a. Long Course Title: Planetary Astronomy
 - b. Short Course Title: PLANET ASTRO
3.
 - a. Catalog Course Description:

This course is an introduction to the current solar system. A comparative study will be made of the planets and their satellites, dwarf planets, asteroids and comets. An overview of the formation, evolution and structure of the solar nebula will be presented. Highlights from previous, current and future interplanetary missions will be incorporated and interpretation of mission results and analysis will be discussed.
 - b. Class Schedule Course Description:

This course is an introduction to the current solar system. A comparative study will be made of the planets and their satellites, dwarf planets, asteroids, and interplanetary debris.
 - c. Semester Cycle (if applicable): N/A
 - d. Name of Approved Program(s):
 - COD GE Pattern
4. Total Units: 4.00 Total Semester Hrs: 108.00
 Lecture Units: 3 Semester Lecture Hrs: 54.00
 Lab Units: 1 Semester Lab Hrs: 54.00
 Class Size Maximum: 28 Allow Audit: No
 Repeatability No Repeats Allowed
 Justification No Repeats Allowed
5. Prerequisite or Corequisite Courses or Advisories:

Course with requisite(s) and/or advisory is required to complete Content Review Matrix (CCForm I-A)

 Advisory: MATH 040
 Advisory: ENG 061
6. Textbooks, Required Reading or Software: *(List in APA or MLA format.)*
 - a. Jeffrey O. Bennett, Megan O. Donahue, Nicholas Schneider, Mark Voit (2014). *Essential Cosmic Perspective, The, 7th Edition* Pearson.
 College Level: Yes
 Flesch-Kincaid reading level: 12
 - b. Gunter Faure, Teresa M. Mensing (2007). *Introduction to Planetary Science: The Geological Perspective* Springer..
 College Level: Yes
 Flesch-Kincaid reading level: 16.5
 - c. Shull, P. and Monson, B.. *Exploring the Universe with Voyager 4: 24 Astronomy Projects for Windows and Macintosh*. Kendall Hunt Publishing; 2 edition (August 15, 2014) , 08-15-2014.
7. Entrance Skills: *Before entering the course students must be able:*
 - a.

Solve linear and quadratic equations and inequalities.

 - MATH 040 - Find the equation of a line and apply it to solve problems with a constant of change.
 - MATH 040 - Solve quadratic equations by factoring, completing the square, taking square roots or the quadratic
 - b.

Be able to recognize equation of lines, quadratic functions, selected conics and graph the corresponding solution set as well as when given the solution set formulate the Algebraic equation.

 - MATH 040 - Recognize when a table, graph, or equation is linear.
 - MATH 040 - Graph and find the equation of a circle.
 - MATH 040 - Recognize when a table, graph, or equation is quadratic.

c.

Understand and utilize functional notation.

- MATH 040 - Apply the definition of a function including function notation and terminology (domain and range).

d.

Communicate effectively with the instructor and mathematical community using proper terminology verbally as well as proper written notation.

- MATH 040 - Apply the definition of a function including function notation and terminology (domain and range).

e.

Solve systems of linear equations.

- MATH 040 - Solve 2x2 and 3x3 systems of linear equations.

f.

Creating equations that model real world situations given in application (word) problems.

- MATH 040 - Find the equation of a line and apply it to solve problems with a constant of change.
- MATH 040 - Create a quadratic model with a table, graph, or equation and solve maximum and minimum problems.

g.

Demonstrate the ability to use research skills including library resources such as books, periodicals, electronic databases and online resources such as the internet.

- ENG 061 - Demonstrate the ability to use research skills including library resources such as books, periodicals, electronic databases and online resources such as the internet.

- ENG 061 - Demonstrate the ability to use research skills including library resources such as books, periodicals, electronic databases and online resources such as the internet.

h.

Recognize features of style such as purpose, audience and tone integrate these elements into academic and professional writing

- ENG 061 - Recognize features of style such as purpose, audience and tone integrate these elements into academic and professional writing
- ENG 061 - Recognize features of style such as purpose, audience and tone integrate these elements into academic and professional writing.

i.

Demonstrate the ability to read and respond in writing beyond the literal interpretation of the text

- ENG 061 - Demonstrate the ability to read and respond in writing beyond the literal interpretation of the text
- ENG 061 - Demonstrate the ability to read and respond in writing beyond the literal interpretation of the text.

8. Course Content and Scope:

Lecture:

1. A Modern View of the Universe
2. Discovering the Universe for Yourself
3. The Science of Astronomy
4. Light and Matter: Reading Messages from the Cosmos
5. Formation of the Solar System
6. The Earth
7. The Moon
8. Mercury: Too Hot for Comfort
9. Venus; Planetary Evolution Gone Bad
10. Mars; The Red Planet
11. Jupiter and the Galilean Satellites

12. Saturn and its Satellites
13. Uranus and Neptune
14. Dwarf Planets: Their Nature and Orbits
15. Comets
16. Asteroids, Meteorites, Meteor and Impact Craters

Lab: (if the "Lab Hours" is greater than zero this is required)

Students will

1. Be introduced to Voyager 4 Astronomy software
2. Learn different types of celestial coordinates
3. Understand the motion of the Sun and learn about the zodiacal constellations
4. Differentiate between phases of the Moon and Planets
5. Explore the apparent reverse motion of planets
6. Learn about seasons and sun's daily motion from different latitudes
7. Understand planetary alignments and predict conjunctions
8. Learn about lunar and solar Eclipse
9. Study the orbital motion of the Galilean Moons of Jupiter
10. Study the rendezvous of Giotto space mission with comet Halley
11. Learn how to maneuver a space mission
12. Apply mission design concepts to find launch date for a space mission to Mars
13. Study solar sunspots and the reason behind their existence
14. Observe the Galilean moons of Jupiter

9. Course Student Learning Outcomes:

1.
Discover the basic processes which shape our planet and compare them to other planets, which come together in current planetary explorations.
2.
Describe ways in which our own models for the origin and evolution of the solar system explain characteristics of newly discovered systems.
3.
Compare the active geological evolution occurring on Earth and on other worlds with their own unique landscapes, rings and moons.
4.
Interpret recent and close-up images of the simplest, most primitive bodies: comets, asteroids and meteors.

10. Course Objectives: *Upon completion of this course, students will be able to:*

- a. Demonstrate knowledge of terminology, basic facts, and concepts pertaining to the origin, structure, and evolution of the solar system.
- b. Differentiate basic characteristics and physical properties of the Terrestrial and Jovian planets.
- c. Compare and contrast chemical and physical processes occurring in the interiors and atmospheres of the Terrestrial and Jovian planets.
- d. List conditions necessary for planetary systems and life forms to exist in the solar system.
- e. Describe the greenhouse process and ozone depletion as it applies to earth and other planets.
- f. Differentiate between comets, asteroids and meteors.

11. Methods of Instruction: *(Integration: Elements should validate parallel course outline elements)*

- a. Collaborative/Team

A 003-Planetary Astronomy

- b. Demonstration, Repetition/Practice
- c. Discussion
- d. Individualized Study
- e. Laboratory
- f. Lecture
- g. Observation
- h. Participation
- i. Self-exploration
- j. Technology-based instruction

12. Assignments: *(List samples of specific activities/assignments students are expected to complete both in and outside of class.)*

In Class Hours: 54.00

Outside Class Hours: 54.00

a. In-class Assignments

1. Viewing slide shows and taking notes.
2. Answering quizzes during the lecture such as essay and multiple choice questions.
3. Participation in classroom activities involving the collection, compilation and interpretation and discussion of information, including the composition of written or oral reports.

b. Out-of-class Assignments

1. Do all reading assignments.
2. Complete assigned homework assignments.

13. Methods of Evaluating Student Progress: *The student will demonstrate proficiency by:*

- Written homework
- Laboratory projects
- Presentations/student demonstration observations
- True/false/multiple choice examinations
- Student participation/contribution

14. Methods of Evaluating: Additional Assessment Information:

15. Need/Purpose/Rationale -- *All courses must meet one or more CCC missions.*

IGETC Area 5: Physical and Biological Sciences (mark all that apply)

A: Physical Science with Lab

CSU GE Area B: Physical and its Life Forms(mark all that apply)

B1 - Physical Science

PO-GE C1-Natural Sciences

Explain concepts and theories related to physical, chemical, and biological natural phenomena.

Draw a connection between natural sciences and their own lives.

IO - Scientific Inquiry

Predict outcomes utilizing scientific inquiry: using evidence and assertions determine which conclusions logically follow from a body of quantitative and qualitative data.

Recognize the utility of the scientific method and its application to real life situations and natural phenomena.

16. Comparable Transfer Course

University System	Campus	Course Number	Course Title	Catalog Year
UC	UC Santa Cruz	ASTR 3	Introductory Astronomy: Planetary Systems	2016
CSU	CSU Sacramento	ASTR 4A	Introduction to the Solar System	2016-2017

17. Special Materials and/or Equipment Required of Students:

18. Materials Fees: Required Material?

Material or Item	Cost Per Unit	Total Cost
-------------------------	----------------------	-------------------

19. Provide Reasons for the Substantial Modifications or New Course:

Change English advisory

20. a. Cross-Listed Course (Enter Course Code): *N/A*
 b. Replacement Course (Enter original Course Code): *N/A*

21. Grading Method (choose one): Letter Grade Only

22. MIS Course Data Elements

- a. Course Control Number [CB00]: CCC000579051
- b. T.O.P. Code [CB03]: 191100.00 - Astronomy
- c. Credit Status [CB04]: D - Credit - Degree Applicable
- d. Course Transfer Status [CB05]: B = Transfer CSU
- e. Basic Skills Status [CB08]: 2N = Not basic skills course
- f. Vocational Status [CB09]: Not Occupational
- g. Course Classification [CB11]: Y - Credit Course
- h. Special Class Status [CB13]: N - Not Special
- i. Course CAN Code [CB14]: *N/A*
- j. Course Prior to College Level [CB21]: Y = Not Applicable
- k. Course Noncredit Category [CB22]: Y - Not Applicable
- l. Funding Agency Category [CB23]: Y = Not Applicable
- m. Program Status [CB24]: 1 = Program Applicable

Name of Approved Program (if program-applicable): COD

Attach listings of Degree and/or Certificate Programs showing this course as a required or a restricted elective.)

23. Enrollment - Estimate Enrollment

First Year: 30
 Third Year: 40

24. Resources - Faculty - Discipline and Other Qualifications:

- a. Sufficient Faculty Resources: Yes
- b. If No, list number of FTE needed to offer this course: *N/A*

25. Additional Equipment and/or Supplies Needed and Source of Funding.

N/A

26. Additional Construction or Modification of Existing Classroom Space Needed. (Explain:)

N/A

27. FOR NEW OR SUBSTANTIALLY MODIFIED COURSES

Library and/or Learning Resources Present in the Collection are Sufficient to Meet the Need of the Students Enrolled in the Course: Yes

28. Originator Ahmed Elshafie Origination Date 11/03/17
