

Course Outline of Record

1. Course Code: A-002
2.
  - a. Long Course Title: Descriptive Astronomy
  - b. Short Course Title: DESCRIP ASTRONOMY
3.
  - a. Catalog Course Description:  
 This course is an introductory survey of planetary, stellar and galactic astronomy designed for students not majoring in science. This course reviews research techniques, current knowledge and theory about the planets, stars, galaxies and the age and origin of the universe.
  - b. Class Schedule Course Description:  
 This course is an introductory survey of planetary, stellar and galactic astronomy designed for students not majoring in science.
  - 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 0
5. Prerequisite or Corequisite Courses or Advisories:  
*Course with requisite(s) and/or advisory is required to complete Content Review Matrix (CCForm1-A)*  
 Advisory: ENG 061  
 Advisory: MATH 040
6. Textbooks, Required Reading or Software: (List in APA or MLA format.)
  - a. Bennett, J., Donahue, M., et. al. (2014). Essential Cosmic Perspective (7/e). Addison-Wesley. ISBN: 9780321928085  
 College Level: Yes  
 Flesch-Kincaid reading level: 12
  - b. Monson, B. and Shull, P.. 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.

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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.
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h.

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

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### 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. Making Sense of the Universe: Understanding Motion, Energy, and Gravity
5. Light: The Cosmic Messenger
6. Formation of the Solar System
7. Earth and the Terrestrial Worlds
8. Jovian Planet System
9. Asteroids, Comets, and Dwarf Planets: Their Nature, Orbits, and Impacts
10. Our Star
11. Surveying the Stars
12. Star Stuff and The Bizarre Stellar Graveyard
13. Our Galaxy and A Universe of Galaxies
14. The Birth of the Universe
15. Dark Matter, Dark Energy, and the Fate of the Universe.

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. Learn about seasons and sun's daily motion from different latitudes
6. Understand planetary alignments and predict conjunctions
7. Learn about lunar and solar Eclipse
8. Study the orbital motion of the Galilean Moons of Jupiter
9. Design a space mission to Mars using Voyager software
10. Learn about stellar magnitude and light pollution
11. Learn about the proper motion of stars
12. Observe the relationship between stellar temperature and magnitude
13. Learn about binary stars
14. Learn about the Milky way and the structure of our universe
15. Apply Hubble law and learn about the expansion of the universe

9. Course Student Learning Outcomes:

1.  
Describe the nebular theory for solar system formation.
2.  
Describe how a terrestrial planet's size affects its level of geological activity and the strength of its magnetic field.
3.  
Identify the physical characteristics of the major Jovian moons.
4.  
Distinguish between comets, asteroids, meteors, meteorites, stars and white dwarfs.
5.  
Determine the lookback time to a galaxy from its distance in light years and estimate its maximum age at the time it emitted the light we are now observing.
6.  
Describe the evidence indicating the presence of black holes and the expansion of the universe.

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

- a. Demonstrate basic understanding and appreciation of the origin, organization and development of astronomy since the ancient Sumerians, Babylonians, Egyptians and Greeks, as well as an appreciation of the role great minds have had in this process.
- b. Recall some of the basic considerations in the history and philosophy of science and the rationale of the scientific method as related specifically to astronomy.
- c. Demonstrate an understanding of the basic techniques of astronomical observation and the utilization and structure of astronomy's basic resource are raw material: electromagnetic radiation, including light.
- d. Describe the operation, construction and historical development of the tools of the astronomer.
- e. Define modern knowledge of the structure of the atom and how this relates to modern astronomy.
- f. Analyze the history of the development of our classifications of the knowledge of the physical structure and motions of the earth, satellites and other members of the solar system.

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- g. Define the structure and functions of the sun, not only as the principal member of the solar system but also as a typical star.
- h. Explain how astronomers classify stars, clusters and nebulae.
- i. Identify the role that modern developments in radio astronomy, the gas and radiation laws have had in the advance of our knowledge about the physical universe.
- j. Recall the highlights in the evolution of man's knowledge regarding the galaxies and the size and evolution of the observable universe.

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

- a. Collaborative/Team
- b. Demonstration, Repetition/Practice
- c. Discussion
- d. Individualized Study
- e. Laboratory
- f. Lecture
- g. Observation
- h. Self-exploration
- i. 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: 108.00

Outside Class Hours: 108.00

#### 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
- Self-paced testing
- Laboratory projects
- Presentations/student demonstration observations
- Group activity participation/observation
- True/false/multiple choice examinations
- Student participation/contribution
- Student preparation

### 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

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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
CSU	CSU San Bernardino	ASTR 103	Descriptive Astronomy	2008-2009
UC	UC Riverside	PHYS 20	Exploring the Universe	2008-2009

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

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18. Materials Fees:  Required Material?

Material or Item	Cost Per Unit	Total Cost
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## 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]: CCC000579052  
 b. T.O.P. Code [CB03]: 191100.00 - Astronomy  
 c. Credit Status [CB04]: D - Credit - Degree Applicable  
 d. Course Transfer Status [CB05]: A = Transfer to UC, 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: 160

Third Year: 200

## 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

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### 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

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