

Cañada College
Official Course Outline

1. **COURSE ID:** ASTR 100 **TITLE:** Introduction To Astronomy
Semester Units/Hours: 3.0 units; a minimum of 48.0 lecture hours/semester
Method of Grading: Grade Option (Letter Grade or P/NP)
Recommended Preparation:
Eligibility for READ 836 and ENGL 836; or ENGL 847 or ESL 400.

2. **COURSE DESIGNATION:**
Degree Credit
Transfer credit: CSU; UC
AA/AS Degree Requirements:
Cañada GE Area B: SCIENTIFIC INQUIRY AND QUANTITATIVE REASONING: B1: Physical Science
CSU GE:
CSU GE Area B: SCIENTIFIC INQUIRY AND QUANTITATIVE REASONING: B1 - Physical Science
IGETC:
IGETC Area 5: PHYSICAL AND BIOLOGICAL SCIENCES: A: Physical Science

3. **COURSE DESCRIPTIONS:**
Catalog Description:
Survey of modern astronomy, including the study of what mankind knows about the universe and our place in it. Emphasis on how mankind has learned about the planets, stars, and galaxies and their structure and formation. Quasars, pulsars, black holes, and the beginning and the end of the universe are discussed.
Schedule of Classes Description
Survey of modern astronomy; study of what mankind knows about the universe and our place in it; including planets, stars, galaxies, quasars, pulsars, black holes, and the beginning and the end of the universe.

4. **STUDENT LEARNING OUTCOME(S) (SLO'S):**
Upon successful completion of this course, a student will meet the following outcomes:
 - A. Students will be able to describe the cause of the seasons
 - B. Students will be able to correctly identify different classes of stars based their position in an HR diagram
 - C. Students will know the difference between the inner and outer planets and the cause for these differences

5. **SPECIFIC INSTRUCTIONAL OBJECTIVES:**
Upon successful completion of this course, a student will be able to:
 - A. Explain the astronomical reasons for the earth's seasons.
 - B. Describe the motions of the planets , moon, sun and stars through the heavens and explain their apparent motion.
 - C. Name the phases of the moon and explain how they are related to the positions of the earth, sun and moon.
 - D. Compare the Heliocentric System of the solar system with the Geocentric system and describe how each explains retrograde motion.
 - E. Explain the significance of Copernicus, Tyco, Kepler, Galileo and Newton to the history of astronomy.
 - F. State Kepler's Laws and explain their significance.
 - G. State Newton's Laws and describe how they provide the 'why' to understanding planetary motion.
 - H. Explain how Einstein's theory of relativity changed our view of the universe.
 - I. Explain how a stellar spectrum helps an astronomer's understanding of the star.
 - J. Compare the different types of telescopes and explain the advantages and disadvantages of each.
 - K. Explain the differences between the inner and outer planets.
 - L. Discuss the nine planets of our solar system and explain the most important characteristics of each.
 - M. Explain the effects of Comets and Asteroids on the planets of the solar system and their role in our understanding of its origins.
 - N. Explain how the solar system formed and why your theory is best one.
 - O. Describe the sun and explain the origin of the its energy.
 - P. Compare the different ways we measure the distances to stars.
 - Q. Explain the HR Diagram and how it is used in astronomy.
 - R. Explain the birth of stars and how they live out their lives.
 - S. Compare the ways a star may end its life.

- T. Explain the parts of a black hole and its effects on Space-time.
- U. Discuss the characteristics of the Milky Way and how our solar system fits into it.
- V. Explain how galaxies cluster together and how this affects our understanding of the overall structure of the universe.
- W. Compare the major types of galaxies and explain how they are different.
- X. Explain what active galaxies are and how they relate to quasars.
- Y. Discuss the big bang theory and how it relates to our understanding of cosmology.
- A@. Explain how the Cosmic Background Radiation reinforces the big bang theory.
- AA. Discuss the most likely scenarios for the beginning and end of the universe and explain why astronomers think these are the best choices.

6. COURSE CONTENT:

Lecture Content:

1. The motions in our sky - the sun, moon, planets, and stars
2. Seasons, time, and the phases of the moon
3. Ancient astronomy and the contributions of the Greeks
4. Ancient astronomy and the contributions of the Greeks
5. The universal law of gravity and orbits in our solar system
6. EM Radiation and spectra
7. Optical and other type of telescopes
8. tides, Solar and Lunar Eclipses
9. The inner planets and their satellites
10. The outer planets, rings and moons
11. Comets, meteors and asteroids
12. Origin of the solar system
13. Our sun
14. The stars and the HR Diagram
15. Birth of stars
16. Death of stars and black holes
17. The Milky Way
18. Galaxies
19. The structure of the universe
20. Quasars and active galaxies
21. The big bang and cosmology

Lab Content:

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TBA Hours Content:

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7. REPRESENTATIVE METHODS OF INSTRUCTION:

Typical methods of instruction may include:

8. REPRESENTATIVE ASSIGNMENTS

Representative assignments in this course may include, but are not limited to the following:

Writing Assignments:

Essays on selected topics

Reading Assignments:

Assignments in required textbook. Average of 1-2 chapters per week.

Other Outside Assignments:

None

To be Arranged Assignments (if applicable):

Not applicable.

9. REPRESENTATIVE METHODS OF EVALUATION

Representative methods of evaluation may include:

- A. Written exams. Comprehensive final exam. Written assignments on selected topics Internet Research

10. REPRESENTATIVE TEXT(S):

Possible textbooks include:

- A. Chaisson, E., McMillan, S. *Astronomy: A Beginner's Guide to the Universe*, 6th ed. Benjamin Cummings,

2009

B. Fraknoi, A., Morrison, D., Wolff, S. C. *Voyages Through the Universe*, 3rd ed. Brooks Cole Publishing, 2005

Origination Date: January 2012

Curriculum Committee Approval Date: February 2012

Effective Term: Fall 2012

Course Originator: Jeanne Digel