This course provides an introduction to the models and nomenclature of modern astronomy, which includes the solar system, the Milky Way, and the universe. The historical development of the science of astronomy is emphasized. A survey of the methods of astronomical observation is also presented.

**JUSTIFICATION FOR COURSE:**

An online addendum is being added to the course so that it can be offered online. A regular update of the content of the COR is also being performed.

**PREREQUISITES:**

**COREQUISITES:**

**ADVISORIES:**

**ASSIGNED DISCIPLINES:**

Astronomy
Physics/Astronomy

**MATERIAL FEE:** Yes [ ] No [X] Amount: $0.00

**CREDIT STATUS:** Noncredit [ ] Credit - Degree Applicable [X] Credit - Not Degree Applicable [ ]

**GRADING POLICY:** Pass/No Pass [ ] Standard Letter [X] Not Graded [ ] Satisfactory Progress [ ]

**OPEN ENTRY/OPEN EXIT:** Yes [ ] No [X]

**TRANSFER STATUS:** CSU Transferable [ ] UC/CSU Transferable [X] Not Transferable [ ]

**BASIC SKILLS STATUS:** Yes [ ] No [X] LEVELS BELOW TRANSFER: Not Applicable

**CALIFORNIA CLASSIFICATION CODES:** Y - Not Applicable

**NON CREDIT COURSE CATEGORY:** Y - Not applicable, Credit Course

**OCCUPATIONAL (SAM) CODE:** E

**REPEATABLE ACCORDING TO STATE GUIDELINES:** No [X] Yes [ ] NUMBER REPEATS:

**REQUIRED FOR DEGREE OR CERTIFICATE:** No [ ] Yes [X]

Liberal Arts: Emphasis in Science(Associate in Arts)

**GE AND TRANSFER REQUIREMENTS MET:**

IGETC Area 5: Physical and Biological Sciences
5A: Physical Science

CSU GE Area B: Scientific Inquiry and Quantitative Reasoning
B1 - Physical Science
COURSE LEVEL STUDENT LEARNING OUTCOME(S) Supported by this course:

1. Demonstrate an understanding of the historical aspects involved in the development of astronomy.
2. Recognize the proper application of the scientific method.
3. Distinguish the various instruments used in modern astronomy, and explain how data are collected and analyzed.
4. Classify the various aspects of planetary, stellar, and galactic properties into their respective operational framework.
5. Explain the various evolutionary models concerning stars, galaxies, and the universe.

COURSE OBJECTIVES:

1. Indicate the scale of the universe, its size and age, and where we fit in.
2. Explain how basic sky phenomena, including seasons and the phases of the Moon, are tied to the broader cosmos.
3. Describe the features of a science and how it differs from a nonscience.
4. Provide a basic explanation of the laws of motion, the crucial conservation laws of angular momentum and energy, and the universal law of gravitation.
5. Give a basic explanation of the properties of light and matter, spectra, and telescopes.
6. Explain the features of our solar system and how it formed.
7. Detail the defining and distinguishing characteristics of the terrestrial planets, jovian planets, and the small bodies of our solar system.
8. Explain the techniques used to detect planets around other stars, the properties of extrasolar planets, and how other planetary systems were formed.
9. Describe the composition of the Sun and the process by which it generates light.
10. List the important properties of stars, how these properties are measured, and how stars are classified according to their properties.
11. Explain the life-cycles of both low- and high-mass stars.
12. Detail the end-points in the life-cycles of stars (white dwarfs, neutron stars, and black holes) and their properties.
13. Describe the evolution and properties of the Milky Way.
14. Explain the properties and evolution of galaxies other than the Milky Way.
15. Give an overview of the Big Bang theory and the evidence supporting it.
16. Describe the natures of dark matter and dark energy, the role of dark matter in galaxy formation, and the implications of dark energy for the fate of the universe.

COURSE CONTENT:

LECTURE CONTENT:

A. Historical Introduction
   1. Scientific Method
   2. Ancient and Greek Astronomy
   3. Classical Period to Issac Newton

B. The Solar System
   1. Earth and Moon
   2. Planets
   3. Asteroids and Comets
   4. Evolution of Solar System
   5. The Sun
C. Data Collection in Astronomy
   1. Light and Matter
   2. Telescopes
D. Stars
   1. Properties
   2. Distance Measurements
   3. Binaries
   4. Variables
   5. Final Stellar States
   6. Evolution
E. The Interstellar States
F. Galaxies
   1. The Milky Way
   2. The Big Bang
   3. Relativistic Models
   4. Alternative Models
   5. The Early Universe

METHODS OF INSTRUCTION:

   A. Lecture:
   B. Online:
   C. Independent Study:
   D. Hybrid:

INSTRUCTIONAL TECHNIQUES:

COURSE ASSIGNMENTS:

Reading Assignments
Textbook and syllabus.

Out-of-class Assignments
Problem sets, online homework, and written reports.

Writing Assignments
Provide a written interpretation of astronomical data. Explain, in writing, the specific discoveries of
the scientists important to the development of astronomy.

METHODS OF STUDENT EVALUATION:

Midterm Exam
Final Exam
Short Quizzes
Written Assignments
Objective Examinations
Projects (ind/group)
Problem Solving Exercises

Demonstration of Critical Thinking:

Synthesis of astronomical information into a coherent framework for further analysis and thought.
Application of astronomical models to unusual or novel situations.

Required Writing, Problem Solving, Skills Demonstration:

Demonstrate an ability to correlate and interpret astronomical data. Recognize the names of the
scientists important to the development of astronomy and explain, in writing, the specifics of their
discoveries.

TEXTS, READINGS, AND RESOURCES:
TextBooks:

LIBRARY:
Adequate library resources include:

Comments:

Attachments:
[Attached Files]