Course Outline

COURSE: ASTR 1      DIVISION: 10      ALSO LISTED AS:  

TERM EFFECTIVE: Summer 2020      CURRICULUM APPROVAL DATE: 05/12/2020  

SHORT TITLE: INTRO GEN ASTRONOMY

LONG TITLE: Introduction to General Astronomy

<table>
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<tr>
<th>Units</th>
<th>Number of Weeks</th>
<th>Type</th>
<th>Contact Hours/Week</th>
<th>Total Contact Hours</th>
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<td>Lecture:</td>
<td>3</td>
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<td>Lab:</td>
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COURSE DESCRIPTION:

An introduction to the realm of astronomy and space science. Topics to be covered include the historical development of astronomy, the physics of gravitation and radiation, the solar system, stellar astronomy, galactic and extragalactic astronomy, and cosmology. ADVISORY: Mathematics 430 or skills equivalent to those in an Elementary Algebra course and college level reading and writing skills.

PREREQUISITES:

COREQUISITES:

CREDIT STATUS: D - Credit - Degree Applicable

GRADING MODES

  L - Standard Letter Grade

REPEATABILITY: N - Course may not be repeated

SCHEDULE TYPES:

  02 - Lecture and/or discussion
  05 - Hybrid
  72 - Dist. Ed Internet Delayed
STUDENT LEARNING OUTCOMES:
By the end of this course, a student should:
1. Describe the basic development of astronomy beginning with astrological foundations of ancient civilizations through modern day theories.
2. Describe the principle motions of the earth, moon, and other solar system members.
3. Describe the basic physics of light, and distinguish between various types of telescopes.
4. Describe the basic composition and construction of the solar system and its origin.
5. Compare and contrast the principle differences between the Terrestrial and Jovian Planets.
6. Describe, compare and contrast the differing properties of stars, and describe accurately their evolutionary processes.
7. Describe the properties of the Milky Way galaxy, and differentiate between other external galaxies.
8. Describe the evolution of the universe, and contrast various models on the further evolution of the universe.

CONTENT, STUDENT PERFORMANCE OBJECTIVES, OUT-OF-CLASS ASSIGNMENTS
Curriculum Approval Date: 05/12/2020
3 HOURS
CONTENT: Introduction and astronomical overview.
OUT OF CLASS ASSIGNMENTS: Reading and questions from text.
PERFORMANCE OBJECTIVES: List a vocabulary of beginning astronomical terms; recognize the various structural components of the universe, sun, moon, earth, planets, stars, galaxies; discuss the overall size and scale of the solar system, galaxy and universe.
3 HOURS
CONTENT: Ancient/modern historical astronomy.
OUT OF CLASS ASSIGNMENTS: Reading and questions from text.
PERFORMANCE OBJECTIVES: Describe the accomplishments of man and civilizations and the development of astronomy from its beginnings, describe the motions of the earth, and how this affects calendars and timekeeping.
3 HOURS
CONTENT: Laws of motion/coordinate systems.
OUT OF CLASS ASSIGNMENTS: Reading and questions from text.
PERFORMANCE OBJECTIVES: Discuss the contributions of early Renaissance astronomers; describe, compare and contrast a celestial sphere and celestial coordinate systems; describe the fundamental differences between solar system models (geocentric versus heliocentric).
3 HOURS
CONTENT: Electromagnetic radiation.
OUT OF CLASS ASSIGNMENTS: Reading and questions from text
PERFORMANCE OBJECTIVES: Describe light and other forms of radiation important to physicists and astronomers. Discuss, compare, contrast and identify principles of light such as reflection, refraction, dispersion.
3 HOURS
CONTENT: Telescopes.
OUT OF CLASS ASSIGNMENTS: Reading and questions from text.
PERFORMANCE OBJECTIVES: Discuss, compare and contrast the basic optical construction of refracting and reflecting telescopes and the advantages/disadvantages of both types; describe the important optical characteristics of lenses and mirrors, thus allowing an educated selection in the purchase of an astronomical telescope.

3 HOURS
CONTENT: The sun and the formation of the solar system.
OUT OF CLASS ASSIGNMENTS: Reading and questions from the text.
PERFORMANCE OBJECTIVES: Describe current theories on how the sun and solar system formed; describe the nuclear reactions that occur in the sun's interior to produce light, heat, and other forms of electromagnetic radiation; describe the means by which energy is transported from the sun's interior to its surface.

3 HOURS
CONTENT: The Earth and moon.
OUT OF CLASS ASSIGNMENTS: Reading and questions from text.
PERFORMANCE OBJECTIVES: Describe the Earth from an astronomical perspective; describe the Earth's interior and atmosphere in comparison with other planetary objects; describe the characteristics of terrestrial-type planets; discuss the Earth's moon, its orbit, interior composition, surface features and origin.

3 HOURS
CONTENT: The terrestrial planets.
OUT OF CLASS ASSIGNMENTS: Reading and questions from text.
PERFORMANCE OBJECTIVES: Identify, compare, contrast and describe the principle characteristics of the planets Mercury, Venus and Mars; discuss continued space exploration by understanding the valuable contributions of modern space research to our understanding of these planets; discuss the interior and atmospheric properties of terrestrial planets, especially in comparison with our own planet.

3 HOURS
CONTENT: The Jovian planets.
OUT OF CLASS ASSIGNMENTS: Reading and questions from text.
PERFORMANCE OBJECTIVES: Describe the principle characteristics of the planets Jupiter, Saturn, Uranus and Neptune; describe the interior and atmospheric properties of Jovian planets, especially in comparison with the Earth and other terrestrial planets; describe the characteristics and formation of Jovian ring systems and Jovian satellites.

3 HOURS
CONTENT: Asteroids, Comets and Meteors.
OUT OF CLASS ASSIGNMENTS: Reading and questions from text.
PERFORMANCE OBJECTIVES: Describe how asteroids were discovered, where they are located, and different types within the solar system; describe the various parts of a comet, where they come from, different types of comet orbits and composition; describe the relationship between comet orbits and meteors, sporadic meteors versus shower meteors; discuss the physical and orbital characteristics of the planet Pluto.
3 HOURS
CONTENT: Stellar observations.
OUT OF CLASS ASSIGNMENTS: Reading and questions from text.
PERFORMANCE OBJECTIVES: Describe how astronomical observations are made in order to derive physical properties of celestial objects; discuss simple observational methods for determining stellar properties such as distance, motion, brightness, temperature and color; describe the science of spectroscopy, compare and contrast the different spectral types of stars, the value of spectral studies to the understanding of important stellar properties.

3 HOURS
CONTENT: Stellar Properties.
OUT OF CLASS ASSIGNMENTS: Reading and questions from the text.
PERFORMANCE OBJECTIVES: Describe, compare, contrast and identify the properties and relationship between properties of celestial objects; describe stellar spectral types and luminosity types; describe the physical nature and makeup of stars, luminosities and temperatures of stars, chemical composition and age.

3 HOURS
CONTENT: Stellar structure and energy.
OUT OF CLASS ASSIGNMENTS: Reading and questions from text.
PERFORMANCE OBJECTIVES: Describe the interior structure of stars; compare and contrast the means by which energy is produced in a variety of ways.

3 HOURS
CONTENT: Stellar evolution.
OUT OF CLASS ASSIGNMENTS: Reading and questions from text.
PERFORMANCE OBJECTIVES: Describe the evolutionary changes that all stars go through, from birth to final death; describe how a star's physical characteristics change as a star evolves; describe the last phases of stellar evolution and identify stellar remnants in the form of white dwarfs, neutron stars, and black holes.

3 HOURS
CONTENT: The Milky Way.
OUT OF CLASS ASSIGNMENTS: Reading and questions from text.
PERFORMANCE OBJECTIVES: Describe the properties of the Milky Way galaxy, types of clusters, our location within the galaxy; compare and contrast the two primary population types of stars; discuss their location within the galaxy and their unique properties.

3 HOURS
CONTENT: Extragalactic Astronomy.
OUT OF CLASS ASSIGNMENTS: Reading and questions from the text
PERFORMANCE OBJECTIVES: Discuss the various types and properties of galaxies within the universe; describe, compare and contrast population types within galaxies, composition of galaxies, and evolution of galaxies.

3 HOURS
CONTENT: Cosmology.
OUT OF CLASS ASSIGNMENTS: Reading and questions from text.
PERFORMANCE OBJECTIVES: Compare, contrast and discuss Cosmological theories that include the Big Bang theory and Steady-State theories, open versus closed models; discuss the importance and value of the Hubble diagram to cosmologists today.
2 HOURS
CONTENT: Review all course materials to prepare for the Final Exam.
OUT OF CLASS ASSIGNMENTS: Students will complete review assignment.
STUDENT PERFORMANCE OBJECTIVES: Students will prepare for the Final Exam.

2 HOURS
FINAL EXAM

METHODS OF INSTRUCTION:
Lecture/discussion, demonstrations, web-based exercises.

OUT OF CLASS ASSIGNMENTS:
Required Outside Hours: 108
Assignment Description:
1. Regularly assigned homework that requires students to analyze and study pertinent text material, solved examples and lecture notes.
2. Regularly assigned homework that requires students to apply the principles and skills covered in class by solving related problems.

METHODS OF EVALUATION:
Writing assignments
Percent of total grade: 20.00 %
Lab reports.
Objective examinations
Percent of total grade: 60.00 %
Objective examinations including multiple choice, true/false, matching items, completion, short answer/essay questions.
Problem-solving assignments
Percent of total grade: 20.00 %
Homework, quizzes, projects.

REPRESENTATIVE TEXTBOOKS:
ISBN: 978-0393936315
Reading Level of Text, Grade: 12 Verified by: Jennifer Nari
ARTICULATION and CERTIFICATE INFORMATION

Associate Degree:
  GAV B1, effective 200470

CSU GE:
  CSU B1, effective 200470

IGETC:
  IGETC 5A, effective 200470

CSU TRANSFER:
  Transferable CSU, effective 200470

UC TRANSFER:
  Transferable UC, effective 200470

SUPPLEMENTAL DATA:

Basic Skills: N
Classification: Y
Noncredit Category: Y
Cooperative Education:
Program Status: 1 Program Applicable
Special Class Status: N
CAN:
CAN Sequence:
CSU Crosswalk Course Department:
CSU Crosswalk Course Number:
Prior to College Level: Y
Non Credit Enhanced Funding: N
Funding Agency Code: Y
In-Service: N
Occupational Course: E
Maximum Hours:
Minimum Hours:
Course Control Number: CCC000301101
Sports/Physical Education Course: N
Taxonomy of Program: 191100