Palo Verde College
One College Drive, Blythe CA 92225
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Course Control Number: CCC000571196		
Course Outline Approval Dates		
Modality	Curriculum Committee	Board of Trustees
Face-to-face	4/11/19	5/14/19
Correspondence Ed.	4/11/19	5/14/19
Distance Ed.		

COURSE OUTLINE OF RECORD

Course Information

Course Initiator: Alejandro Garcia and Nidhi R. Patel, PhD				
CB01 - Subject and Course #: AST 101				
CB02 - Course Title: Introductory Astronomy				
New Course: ☐	Non-Substantial: ☒	Substantial: ☐		
Articulation Request:	☒ UC	☒ CSU	☒ CSU-GE	☒ IGETC
Lecture Hours: 54	Laboratory Hours:	Clinical/Field Hours:		
CB06/CB07: Course Units: 3.0				
Prerequisites:				
Co-requisites:				
Advisories:	Completion of MAT 095 or appropriate placement. In addition, completion of ENG 099 Basic Composition or placement in ENG 100 or ENG 101 based on AB 705 mandates.			

CB03 - TOP Code:	1911.00 - Astronomy
CB04 - Credit Status:	D - Credit - Degree Applicable
CB05 - Transfer Status:	A - Transferable to both UC and CSU
CB08 - Basic Skills Status:	N - Course is not a basic skills course
CB09 - SAM Priority Code:	E - Non-Occupational
CB10 - Cooperative Work:	N - Is not part of Cooperative Work Experience Education Program
CB11 - Course Classification:	Y - Credit Course
CB13 - Approved Special:	N - Course is not a special class
CB21 - Prior Transfer Level:	Y - Not Applicable
CB22 - Noncredit Category:	Y - Credit Course
CB23 - Funding Agency:	Y - Not Applicable
CB24- Program Status:	1 - Program Applicable
Transfer Request:	A= UC and CSU

Please select the appropriate box(s) of the modalities in which this course will be offered, and fill out the appropriate sections for that mode.

☒ Face-to-Face – Section B
☒ Correspondence Education – Section C
☐ Distance Education – Section D

JUSTIFICATION OF NEED:

AST 101 meets IGETC 5A and CSU-GE B1.

CATALOG DESCRIPTION:

This course is an introduction to general astronomy. Its topics include the history of astronomy and the development of modern astrophysics, the structure and origin of the solar system and the Milky Way galaxy, modern techniques and instruments, the character of the nebulae and galaxies, stellar characters and theories, the search for extraterrestrial life, and the implications of astronomical discoveries. Special emphasis is placed on recent research in astronomy and the latest discoveries and tools used in modern astronomy.

COURSE OBJECTIVES:

The purpose of this course is to:
1. Acquaint students with the Copernican revolution: The birth of modern astronomy.
2. Explain the observed workings of the cosmos by means of light and matter.
3. Prepare students for the use of computer and astronomy equipment to determine the characteristics of the solar objects.
4. Explain how Kepler's laws enable us to construct a scale model of the solar system.
5. Improve students' understanding of light and electromagnetic radiation.
6. Acquaint students with the basic designs of the major types of optical telescopes used by astronomers.
7. Explain the major spacecraft missions that have contributed to our knowledge of the solar system.
8. Describe the nature and origin of Earth's magnetosphere.
9. Improve students' understanding of the key orbital and physical properties of the terrestrial and jovian planets
10. Acquaint students with the different theories of the origin of the solar system and our galaxy.
11. Improve students' understanding of the composition and physical properties of the stars.
12. Prepare students to analyze the theory of star formation.
13. Acquaint students with the stages in the death of a typical low-mass star.
14. Explain supernovae, neutron stars, pulsars, and black holes.
15. Explain how the age of the universe is determined.
16. Explain how matter emerged from the Big Bang
17. Evaluate the chances of finding life elsewhere in the universe.

STUDENT LEARNING OUTCOMES:

Upon successful completion of the course, the student will be able to:
1. Explain the geometric reasoning that allows astronomers to measure the distances and sizes of faraway objects.
2. Summarize the role of Renaissance Science in the history of astronomy.
3. Sketch and describe the basic designs of the major types of optical telescopes used by astronomers.

A. COURSE OUTLINE AND SCOPE

1. Outline of topics or content:

1. The Copernican revolution.
2. Light and matter.
3 Telescopes.
4. The solar system.
5. Earth and its moon.
6. The terrestrial planets.
7. The jovian planets.
8. Moons, rings and plutoids.
9. The Sun.
10. Measuring the stars.
11. The interstellar median.
12. Stellar evolution.
13. Neutron stars and black holes.

14. The Milky Way galaxy.
15. Normal and active galaxies.
16. Galaxies and dark matter.
17. Cosmology
18. Life in the universe.

2. If a course contains laboratory or clinical/field hours, list examples of activities or topics:

3. Examples of reading assignments:

Reading assignments include, but are not limited to, study guides, instructional materials delivered by mail, textbook reading assignments, instruction by computer-aided projects, practice worksheets, homework, quizzes, exams, projects, and articles from scientific journals under the guidance of the instructor.

4. Examples of writing assignments:

Writing assignments include, but are not limited to, practice worksheets, homework, quizzes, exams, projects, and reports under the guidance of the instructor. For example, instructor may assign students to write a two to three page report of the main-sky happenings during the current month and how it relates to topics covered in the course.

5. Appropriate assignments to be completed outside of class:

Outside of class assignments include, but are not limited to, study guides, instructional materials delivered by mail, textbook, instruction by computer-aided projects, practice worksheets, homework, quizzes, exams, projects, and articles from scientific journals under the guidance of the instructor. For example, instructor may assign students to use binoculars or the unaided eye and write a description of the prominent constellations, including Orion, Canis Major, Taurus, Gemini, Leo, Ursa Major, and Cassiopeia; keep track of progress in the ongoing construction of super telescopes at key locations throughout the world.

6. Appropriate assignments that demonstrate critical thinking:

Assignments that demonstrate critical thinking include, but not limited to, homework, quizzes, exams, projects, and reports under the guidance of the instructor. For example, instructor may assign students to a) investigate whether the alignment of the Earth, the Moon, and the Sun during a solar eclipse causes earthquakes on our planet or whether there are possible connections between these alignments and plate tectonics; and b) evaluate the apparent consequence of manned space travel to the Moon or other planets in our solar system and determine the political, financial, and scientific ramifications of such explorations.

7. Other assignments (if applicable):

Other assignments include, but not limited to, study guides, instructional materials delivered by mail, textbook, instruction by computer-aided projects, practice worksheets, homework, quizzes, exams, projects, and reports under the guidance of the instructor. For example, instructor may assign students to a) simulate trajectory of planets around the Sun and calculate the eccentricity of the planets by using tacks and a string to draw ellipses; b) observe the constellations, such as the Big Dipper or the Orion, and draw a picture of their relative positions; and c) visit astronomy museums, observatories, and observation sites.

☐ Check if Section B is not applicable

B. FACE-TO-FACE COURSE SECTIONS:

Face-to-face education
Is a mode of delivery in which instruction is delivered in a traditional classroom setting, with instructor and students located simultaneously in the same classroom facility.

1. Describe the methods of instruction:

Methods of instruction include, but are not limited to, lectures, study guides, textbook, instruction by computer-aided projects, group activities, practice worksheets, homework, quizzes, exams, projects, and reports under the guidance of the instructor.

2. Describe the methods of evaluating of student performance.

Methods of evaluating student performance include, but are not limited to, homework, quizzes, exams, projects, and reports under the guidance of the instructor. For example, instructor may test students every two or three chapters of the text, for a total of about four or five tests, where the tests may include multiple choice, fill-in-the-blanks, and short descriptive essays.

3. Describe how the confidentiality of the student's work and grades will be maintained.

Instructors shall make reasonable efforts to protect the confidentiality of students' grades and graded work consistent with practices described in the Family Education Rights and Privacy Act (FERPA).

4. If the course has a lab component, describe how lab work is to be conducted and how student work is to be evaluated.

NOTE: Students will be encouraged by instructors of this course to direct themselves to the College's Disabled Students' Programs and Services (DSP&S) department if they believe they have a learning disability.

☐ Check if Section C is not applicable

C. CORRESPONDENCE EDUCATION COURSE SECTIONS (Correspondence, hybrid correspondence)

Correspondence education
is a mode of delivery in which instructional materials are delivered by mail, courier or electronic transmission to students who are separated from the instructor by distance. Contact between instructor and students is asynchronous.
Hybrid correspondence education
is the combination of correspondence and face-to-face interaction between instructor and student.

1. Describe the methods of instruction.

Methods of instruction include, but are not limited to, study guides, instructional materials delivered by mail, textbook, instruction by computer-aided projects, practice worksheets, homework, quizzes, exams, projects, and reports under the guidance of the instructor. For example, instructor may instruct students to turn in work after which the instructor will review it and send it back with appropriate corrections. Once student acknowledge their mistakes, they send it back to the instructor indicating that they understand the material.

2. Describe the methods of evaluating student performance.

Methods of evaluating student performance include, but are not limited to, homework, quizzes, exams, projects, and reports under the guidance of the instructor. For example, instructor may test students every two or three chapters of the text, for a total of about four or five tests, where the tests may include multiple choice, fill-in-the-blanks, and short descriptive essays.

3. Describe how regular, effective contact between the instructor and a student is maintained.

Regular, effective contact includes, but is not limited to, exams; quizzes; essays; research papers; graded homework assignments; syllabus receipt; office hours; e-mails; letters; notes; phone calls; or postings on the Bridge between instructor and student.

4. Describe procedures that help verify the individual submitting class work is the same individual enrolled in the course section.

Consistent with policy elements listed in the ACCJC's "Policy on Distance Education and on Correspondence Education," the College verifies the identity of a student who participates in class or coursework by using, at the College's discretion, such methods as a secure log-in and password, proctored examinations, or other technologies or practices that are developed and effective in verifying each student's identification.

5. Describe procedures that evaluate the readiness of a student to succeed in a correspondence or hybrid correspondence course section.

The procedure might consist of a short assessment questionnaire prepared by the instructor and self-administered by the student. The questionnaire would evaluate areas such as working independently, adhering to timelines, and familiarity with working online and with computer technology. The student would use the resulting score to evaluate his or her readiness to take the course in a correspondence or hybrid correspondence instructional mode.

6. Describe how the confidentiality of the student's work and grades will be maintained.

Instructors shall make reasonable efforts to protect the confidentiality of students' grades and graded work consistent with practices described in the Family Education Rights and Privacy Act (FERPA).

7. If the course has a lab component, describe how lab work is to be conducted and how student work is to be evaluated.

8. If the course requires specialized equipment, including computer and computer software or other equipment, identify the equipment, and describe how it is to be accessed by students.

Note: Students will be encouraged by instructors of this course to direct themselves to the College's Disabled Students' Programs and Services (DSP&S) department if they believe they have a learning disability.

☒ Check if Section D is not applicable

D. DISTANCE EDUCATION COURSE SECTIONS (online, ITV, hybrid)

Online education
is a mode of delivery in which all instruction occurs online via the Internet. Student and instructor access to email and the Internet is required. Students are required to complete class work using

email, chat rooms, discussion boards and other instructional online venues.

Interactive television (ITV)
is a mode of synchronous delivery in which instruction occurs via interactive television (closed circuit).

Hybrid instruction
is a combination of face-to-face instruction and online instruction.

1. Describe the methods of instruction.

2. Describe the methods of evaluating of student performance.

3. Describe how regular, effective contact between the instructor and a student is maintained.

4. Describe procedures that help verify the individual submitting class work is the same individual enrolled in the course section.

5. Describe procedures that evaluate the readiness of a student to succeed in an online, ITV or hybrid course section.

6. Describe how the confidentiality of the student's work and grades will be maintained.

7. If the course has a lab component, describe how lab work is to be conducted and how student work is to be evaluated.

8. If the course requires specialized equipment, including computer and computer software or other equipment, identify the equipment, and describe how it is to be accessed by students.

Note: Students will be encouraged by instructors of this course to direct themselves to the College's Disabled Students' Programs and Services (DSP&S) department if they believe they have a learning disability.

E. REPRESENTATIVE TEXTBOOKS AND OTHER READING AND STUDY MATERIALS:
List author, title, and current publication date of all representative materials.

Chaisson and McMillan, Astronomy: A Beginner's Guide to the Universe, 8th Edition, Pearson, 2017 (or most recent edition)

SIGNATURES

COURSE INITIATOR: _____ DATE: _____

DIVISION CHAIR: _____ DATE: _____

LIBRARY: _____ DATE: _____

CHAIR OF CURRICULUM COMMITTEE: _____ DATE: _____

SUPERINTENDENT/PRESIDENT: _____ DATE: _____