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(760) 921-5500

Course Control Number: CCC000161730		
Course Outline Approval Dates		
Modality	Curriculum Committee	Board of Trustees
Face-to-face		
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 105			
CB02 - Course Title: Astronomy: The Solar System			
New Course: <input type="checkbox"/>		Non-Substantial: <input checked="" type="checkbox"/>	
		Substantial: <input type="checkbox"/>	
Articulation Request: <input checked="" type="checkbox"/> UC		<input checked="" type="checkbox"/> CSU	
		<input checked="" type="checkbox"/> CSU-GE	
		<input checked="" type="checkbox"/> IGETC	
Lecture Hours: 54		Laboratory Hours: 54	
		Clinical/Field Hours:	
CB06/CB07: Course Units: 4.0			
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 105 meets IGETC 5A, 5C and CSU-GE B1, B3. Astronomy 105 concentrates on the Solar System. Earth is just one of many objects in the Solar System, so it is important that students know about their home world. Today, we have sent space crafts to all the planets and their moons in the Solar System. There are discoveries almost daily. Students need to be aware of current scientific events that impact the world around them. The Palo Verde College's Colorado River Astronomy Club periodically invites the college students and the community to view our neighboring planets and moons. A scientific knowledge of astronomy is essential to understanding the space exploration for which there are ample opportunities of employment.

CATALOG DESCRIPTION:

As a survey of the solar system, Astronomy 105 covers essential concepts and principles necessary for the study of the heavens, including Kepler's and Newton's Laws, radiation, spectroscopy and telescope technology. The course also studies the planets, moons, asteroids, comets, and the Sun. Lab sections consist of observations and calculations of trajectories, as well as calculations of the size and mass of solar objects.

COURSE OBJECTIVES:

The purpose of this course is to:

1. Acquaint students with the overall scale and structure of the solar system.
2. Explain how the observed motions of the planets led to our modern view of the Sun-centered solar system.
3. Prepare students for the use of computer and astronomy equipment to determine the characteristics and movements of the solar objects.
4. Explain how Kepler's laws enable us to construct a scale model of the solar system, and explain the technique used to determine the actual size of the planetary orbits.
5. Improve students' understanding of Kepler's laws of motion and universal gravitation and explain how they account for Newton's laws.
6. Improve students' understanding of electromagnetic radiation and how radiation transfers energy and information through interstellar space.
7. Acquaint students with the kinds of information that can be obtained by analyzing the spectra of astronomical objects.
8. Acquaint students with the basic designs of the major types of optical telescopes used by astronomers.
9. Explain the major spacecraft missions that have contributed to our knowledge of the solar system.
10. Describe the nature and origin of Earth's magnetosphere.
11. Summarize the various theories for the formation of the Moon, and indicate which is presently considered most likely.
12. Improve students' understanding of the key orbital and physical properties of Mercury, Venus, Mars, Jupiter, Saturn, Uranus, and Pluto.
13. Acquaint students with the different theories of the origin of the solar system.
14. Improve students' understanding of solar properties.

STUDENT LEARNING OUTCOMES:

Upon successful completion of the course, the student will be able to:

1. Summarize the basic differences between the terrestrial and the jovian planets
2. State Kepler's laws of motion and universal gravitation and explain how they account for Newton's laws.
3. Describe the key orbital and physical properties of Mercury, Venus, Mars, Jupiter, Saturn, Uranus and Pluto.

A. COURSE OUTLINE AND SCOPE

1. Outline of topics or content:

1. The foundations of astronomy
2. The Copernican revolution
3. Radiation
4. Spectroscopy
5. Telescopes
6. The solar system: an introduction to comparative planetology
7. Earth
8. Moon and Mercury
9. Venus
10. Mars

11. Jupiter
12. Saturn
13. Uranus
14. Solar system debris
15. The formation of planetary systems

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

As part of this course, students will be provided with lab work to be completed individually or as a cooperative group. Selected activities from Learning Astronomy by Doing Astronomy: Collaborative Lecture Activities by Palen and Larson will be provided to proctors. The project will be graded individually or as a cooperative group.

Illustrate Kepler's Laws using cardboard, strings and tacks to make a model.

Make models to illustrate the phases of the moon.

Track the seasonal movement of the sun.

3. Examples of reading assignments:

Use the library or/and the internet to read about the Galileo and the authority of the church.

Consult a physics text or an advanced astronomy text to learn how it is possible to weigh the Sun.

4. Examples of writing assignments:

Write short essays about the following:

How Ptolemy and Copernicus each explained the retrograde motion of the planets.

How crater counts allow us to estimate the ages of surfaces throughout the solar system.

How the newly discovered solar systems and planets compare to our own.

5. Appropriate assignments to be completed outside of class:

a. Observe and track the altitude of the Sun, maintaining written records for a period of at least one month.

b. Use triangulation to determine the width of the Colorado River, without crossing it.

c. Use a string, two tacks, and a pencil to draw an ellipse. Use your drawing to explain Kepler's laws.

d. Use a flashlight, a transparent recipient containing hydrogen (or some other gas), a prism, and a screen to determine the absorption and emission lines of the gas.

e. Use a prism to decompose light into its components. What are the corresponding frequencies and wavelengths?

f. Carefully dismantle a small Newtonian telescope and either a refractor telescope or binoculars. Name the different parts, explain how they work, and reassemble it.

6. Appropriate assignments that demonstrate critical thinking:

Provide a reasoned analysis explaining whether you believe that the next NASA exploration to Mars should be manned or unmanned.

7. Other assignments (if applicable):

Field trips to observation sites, museums of astronomy, and to observatories, when possible.

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:

2. Describe the methods of evaluating of student performance.

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

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.

The instructor will assign work such as essays, tests, and projects. The student will turn in the work, the instructor will review it and send it back with appropriate corrections. The student must check his mistakes and send it back to the instructor. The process will continue until the instructor is convinced that the student completely understands the material.

2. Describe the methods of evaluating student performance.

A test is given every two or three chapters of the text, for a total of about 4 or 5 tests. The tests 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; 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.

As part of this course, students will be provided with lab work to be completed individually or as a cooperative group. If proctors are necessary, they will distribute the lab work and be in charge of monitoring the activity. Selected activities from Learning Astronomy by Doing Astronomy: Collaborative Lecture Activities by Palen and Larson will be provided to proctors. The project will be graded individually or as a cooperative group.

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.

This course does not require specialized equipment.

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.

TEXT;

ASTRONOMY TODAY, Chaisson & McMillan, Pearson, 8th Edition, 2013 (or most recent edition)

LABORATORY:

Learning Astronomy by Doing ASTRONOMY (Collaborative Lecture activities), Stacy Palen & Ana M. Larsen, 2015 (or most recent edition)

SIGNATURES

COURSE INITIATOR: _____

DATE: _____

DIVISION CHAIR: _____

DATE: _____

LIBRARY: _____

DATE: _____

CHAIR OF CURRICULUM COMMITTEE: _____

DATE: _____

SUPERINTENDENT/PRESIDENT: _____

DATE: _____