

A 001: DESCRIPTIVE ASTRONOMY

Originator

aelshafie

Justification / Rationale

Replacing Math 040 with Math 049

Effective Term

Fall 2023

Credit Status

Credit - Degree Applicable

Subject

A - Astronomy

Course Number

001

Full Course Title

Descriptive Astronomy

Short Title

DESCRIP ASTRONOMY

Discipline**Disciplines List**

Physics/ Astronomy

Modality

Face-to-Face

100% Online

Hybrid

Catalog Description

This course is an introductory survey of planetary, stellar and galactic astronomy designed for students not majoring in science. This course reviews research techniques, current knowledge and theory about the planets, stars, galaxies and the age and origin of the universe.

Schedule Description

This course is an introductory survey of planetary, stellar and galactic astronomy designed for students not majoring in science. Advisory: ENG 061 & MATH 049 IGETC: 5A

Lecture Units

3

Lecture Semester Hours

54

Lab Units

0

In-class Hours

54

Out-of-class Hours

108

Total Course Units

3

Total Semester Hours

162

Prerequisite Course(s)

Advisory: ENG 061 & MATH 049

Required Text and Other Instructional Materials**Resource Type**

Book

Author

Bennett, J., Donahue, M., et. al.

Title

Essential Cosmic Perspective

Edition

9

Publisher

Pearson

Year

2019

College Level

Yes

Flesch-Kincaid Level

12

ISBN #

978-0134874364

Resource Type

Book

Open Educational Resource

Yes

Author

Andrew Fraknoi, David Morrison, Sidney C. Wolff

Title

Astronomy by OpenStax

Edition

2nd

Publisher

Openstax

Year

2022

ISBN #978-1-951693-50-3

Class Size Maximum

45

Entrance Skills

Interprets slope as a rate of change.

Requisite Course Objectives

MATH 049-Interpret slope as a rate of change, in preparation for generalizing the rate of change to the derivative in the Calculus course.

Entrance Skills

Recognize when a table, graph, or equation is linear.

Requisite Course Objectives

MATH 049-Recognize when a table, graph, or equation is quadratic.

Entrance Skills

Create a linear model in the form of a table, graph, or equation.

Requisite Course Objectives

MATH 049-Create and comprehend a linear model in the form of a table, graph, or equation from a verbal description, using the rule of 4.

Entrance Skills

Comprehend that the key characteristic of a linear model is its constant rate of change.

Requisite Course Objectives

MATH 049-Find the equation of a line and apply it to solve problems with a constant rate of change.

Entrance Skills

Demonstrate the ability to think critically and express ideas using various patterns of development.

Requisite Course Objectives

ENG 061-Demonstrate the ability to think critically and express ideas using various patterns of development.

Entrance Skills

Demonstrate the ability to use research skills including library resources such as books, periodicals, electronic databases and online resources such as the internet.

Requisite Course Objectives

ENG 061-Demonstrate the ability to use research skills including library resources such as books, periodicals, electronic databases and online resources such as the internet.

Entrance Skills

Demonstrate the ability to read and respond in writing beyond the literal interpretation of the text.

Requisite Course Objectives

ENG 061-Demonstrate the ability to read and respond in writing beyond the literal interpretation of the text.

Course Content

1. The beginnings of astronomy, its aims, methods and basic tools
2. Planetary motions
3. Energy and the atom: the basis of astrophysics
4. Natural and Artificial Satellites

5. Physical characteristics of the planets
6. Asteroids, meteoroids and comets
7. The age and origin of the solar system
8. The sun: a typical star
9. The stars: a general description
10. Deviant stars
11. The evolution of stars
12. Multiple stars and clusters of stars
13. Between the stars: the realm of the nebulae
14. Galaxies
15. The universe and relativity

Course Objectives

	Objectives
Objective 1	Demonstrate basic understanding and appreciation of the origin, organization and development of astronomy since the ancient Sumerians, Babylonians, Egyptians and Greeks, as well as an appreciation of the role great minds have had in this process.
Objective 2	Recall some of the basic considerations in the history and philosophy of science and the rationale of the scientific method as related specifically to astronomy.
Objective 3	Demonstrate an understanding of the basic techniques of astronomical observation and the utilization and structure of astronomy's basic resources are raw materials: electromagnetic radiation, including light.
Objective 4	Describe the operation, construction and historical development of the tools of the astronomer.
Objective 5	Define modern knowledge of the structure of the atom and how this relates to modern astronomy.
Objective 6	Analyze the history of the development of our classifications of the knowledge of the physical structure and motions of the earth, satellites and other members of the solar system.
Objective 7	Define the structure and functions of the sun, not only as the principal member of the solar system but also as a typical star.
Objective 8	Explain how astronomers classify stars, clusters and nebulae.
Objective 9	Identify the role that modern developments in radio astronomy, the gas and radiation laws have had in the advancement of our knowledge about the physical universe.
Objective 10	Recall the highlights in the evolution of man's knowledge regarding the galaxies and the size and evolution of the observable universe.

Student Learning Outcomes

	Upon satisfactory completion of this course, students will be able to:
Outcome 1	Compare and contrast physical characteristics of planets, stars, and other celestial bodies.
Outcome 2	Identify theories or processes relating to the origin and evolution of stars and the physical universe.
Outcome 3	Describe the scale and extent of our physical universe and our place within it.
Outcome 4	Describe the motion of the objects in the night sky and how it varies as a function of time.

Methods of Instruction

Method	Please provide a description or examples of how each instructional method will be used in this course.
Collaborative/Team	Students work collaboratively on a topic. Present their findings to the rest of class about a certain topic.
Technology-based instruction	Real-time quizzes are used. Students need to use their laptops, phones or tablets to respond to these types of questions.
Lecture	Power point presentations are used during lecture to communicate ideas, description of materials with the help of visual images.
Discussion	Students are asked to work in groups to answer a discussion question. Each group shares their answer. A discussion between groups and instructor takes place to clarify misconceptions.

Methods of Evaluation

Method	Please provide a description or examples of how each evaluation method will be used in this course.	Type of Assignment
Self-paced testing	Before each lecture, students have a reading assignment. Normally, the chapter that we will cover in the coming class meeting. Once they are in class, they take a pre-class quiz to measure student understanding of the reading material. Pre-class reading is about 30 to 40 pages per week.	Out of Class Only
Tests/Quizzes/Examinations	Multiple exams take place during the semester to best evaluate student understanding of the material. Three exams take place during the semester.	In Class Only
Computational/problem-solving evaluations	Students are required to do homework. Questions in the homework vary between multiple choice, essay, and interactive tutorials. On average, homework takes around 1.5 hour per week.	Out of Class Only
Group activity participation/observation	Students are asked to work in groups to research a topic and present their findings to the rest of the class. A discussion between students takes place and instructor clarifies misconceptions.	In Class Only
Reading reports	After each chapter, students are expected to read the chapter one more time and advised through the semester to summarize their learning in a couple of pages. This will enhance students' independent study outside class.	Out of Class Only

Assignments
Other In-class Assignments

1. Viewing of films and slide programs, including the taking of notes thereon.
2. Listening to sound recording and taking notes thereon.
3. Special reports by student, in panel or singly.
4. Participation in class research projects involving the collection, compilation and interpretation of data, including the composition of written or oral reports thereon.
5. Examination of various types, such as essay and multiple choice.

Other Out-of-class Assignments

1. Do all reading assignments (text, study guides, handouts)
2. Complete assigned homework assignments

Grade Methods

Letter Grade Only

Distance Education Checklist

Include the percentage of online and on-campus instruction you anticipate.

Instructional Materials and Resources

If you use any other technologies in addition to the college LMS, what other technologies will you use and how are you ensuring student data security?

We are going to use Mastering Astronomy and Learning Catalytics which is bundled with Mastering Astronomy. Mastering Astronomy is part of Pearson publisher they handle student data security.

If used, explain how specific materials and resources outside the LMS will be used to enhance student learning.

With Mastering Astronomy, students will have access to the book in the form of an etext. Students will have a study area, where they can do the reading, visual, conceptual quizzes, and self-guided tutorials. This is in addition to the homework system and the vocabulary study tool.

Effective Student/Faculty Contact

Which of the following methods of regular, timely, and effective student/faculty contact will be used in this course?

Within Course Management System:

Chat room/instant messaging
Discussion forums with substantive instructor participation
Online quizzes and examinations
Regular virtual office hours
Timely feedback and return of student work as specified in the syllabus
Video or audio feedback
Weekly announcements

External to Course Management System:

Posted audio/video (including YouTube, 3cm mediasolutions, etc.)

Briefly discuss how the selected strategies above will be used to maintain Regular Effective Contact in the course.

One of my main goals is to maintain effective contact and engagement with students. I am planning to achieve this by addressing three main ways: A) Learner to Resources B) Learner to Learner C) Faculty to Learner

A) Learner to Resources: Students are required to read the chapter before taking a pre-chapter quiz. They will have access to lecture and video material to comprehend each chapter goals and outcome. When they are done with their learning resources, they will take the post-chapter quiz, do their homework and post their learning summary.

B) Learner to Learner: At the beginning of the semester, students are going to introduce themselves and students are going to make groups based on majors or interests.

Students are going to submit their summarized learning for each chapter and view other students summary, comment on them in discussion forums.

Students are going to be interacting with each other on group project and study sessions.

C) Faculty to Learner: Announcements will be used throughout the course. I am going to hold regular virtual office hours and virtual group office hours. I am going to post feedback on student and group work.

If interacting with students outside the LMS, explain how additional interactions with students outside the LMS will enhance student learning.

Some of the videos will be posted on 3cm mediasolutions. I am planning to use zoom for virtual group discussions.

Other Information

Comparable Transfer Course Information

University System

CSU

Campus

San Diego State University

Course Number

ASTR 101

Course Title

Principles of Astronomy

Catalog Year

2022-2023

University System

CSU

Campus

CSU San Marcos

Course Number

ASTR 101

Course Title

Introduction to Astronomy

Catalog Year

2022-2023

COD GE

C1 - Natural Sciences

CSU GE

B1 - Physical Science

IGETC GE

5A - Physical Science

MIS Course Data**CIP Code**

40.0201 - Astronomy.

TOP Code

191100 - Astronomy

SAM Code

E - Non-Occupational

Basic Skills Status

Not Basic Skills

Prior College Level

Not applicable

Cooperative Work Experience

Not a Coop Course

Course Classification Status

Credit Course

Approved Special Class

Not special class

Noncredit Category

Not Applicable, Credit Course

Funding Agency Category

Not Applicable

Program Status

Program Applicable

Transfer Status

Transferable to both UC and CSU

General Education Status

Y = Not applicable

Support Course Status

N = Course is not a support course

Allow Audit

No

Repeatability

No

Materials Fee

No

Additional Fees?

No

Approvals**Curriculum Committee Approval Date**

11/01/2022

Academic Senate Approval Date

11/10/2022

Board of Trustees Approval Date

12/16/2022

Chancellor's Office Approval Date

12/21/2022

Course Control Number

CCC000635078

Programs referencing this courseLiberal Arts: Math and Science AA Degree (<http://catalog.collegeofthedesert.eduundefined/?key=29>)