

# A 001: DESCRIPTIVE ASTRONOMY

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**Originator**

aelshafie

**Co-Contributor(s)****Name(s)****Justification / Rationale**

Adding an online modality.

Astronomy is one of the descriptive sciences which can be taught in an online setting. Offering an online course in Astronomy will benefit non-traditional students and students who prefer online courses. This is a one-step going toward OEI. This will also aid the college in scheduling and utilizing room usage.

**Effective Term**

Fall 2019

**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

**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 040 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 &amp; MATH 040

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

Book

**Author**

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

**Title**

Essential Cosmic Perspective

**Edition**

8

**Publisher**

Pearson

**Year**

2017

**College Level**

Yes

**Flesch-Kincaid Level**

12

**ISBN #**

978-0-13-470

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**Class Size Maximum**

45

**Entrance Skills**

Interprets slope as a rate of change.

**Prerequisite Course Objectives**

MATH 040-Interpret slope as a rate of change.

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**Entrance Skills**

Recognize when a table, graph, or equation is linear

**Prerequisite Course Objectives**

MATH 040-Recognize when a table, graph, or equation is linear.

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**Entrance Skills**

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

**Prerequisite Course Objectives**

MATH 040-Create a linear model in the form of a table, graph, or equation.

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**Entrance Skills**

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

**Prerequisite Course Objectives**

MATH 040-Comprehend that the key characteristic of a linear model is its constant rate of change.

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**Entrance Skills**

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

**Prerequisite Course Objectives**

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

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**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

**Prerequisite 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.

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**Entrance Skills**

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

**Prerequisite Course Objectives**

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

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**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 resource are raw material: 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 advance 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 tablet 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 share 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, Student preparation	Before each lecture, students have a reading assignment. Normally, the chapter which 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 takes place during the semester.	In Class Only
Computational/problem-solving evaluations	Students are required to do homework. Question 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 clarify 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.

## 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

### 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:

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

## Online Course Enrollment

**Maximum enrollment for online sections of this course**

45

## Other Information

### Comparable Transfer Course Information

#### University System

CSU

#### Campus

CSU San Bernardino

#### Course Number

ASTR 103

#### Course Title

Descriptive Astronomy

#### Catalog Year

2008-2009

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#### University System

UC

#### Campus

UC Riverside

#### Course Number

PHYS 20

#### Course Title

Exploring the Universe

#### Catalog Year

2008-2009

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#### University System

UC

#### Campus

UC Irvine

#### Course Number

PH 20A

#### Course Title

Introduction to Astronomy

#### Catalog Year

2010-2011

**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

**Allow Audit**

No

**Repeatability**

No

**Materials Fee**

No

**Additional Fees?**

No

## Approvals

**Curriculum Committee Approval Date**

03/15/20109

**Academic Senate Approval Date**

03/14/2019

**Board of Trustees Approval Date**

04/10/2019

**Course Control Number**

CCC000324572