ASTR 110 - Descriptive Astronomy Course Outline

Approval Date:
Effective Date: 01/16/2018

SECTION A

Unique ID Number	CCC000234838
Discipline(s)	Physics/Astronomy
Division	Science and Engineering
Subject Area	Astronomy
Subject Code	ASTR
Course Number	110
Course Title	Descriptive Astronomy
TOP Code/SAM Code	1911.00 - Astronomy / -
Rationale for adding this course to the curriculum	Course update (last reviewed 1986) Remove sky observations, which make more sense in our other astronomy course (111) which is all about planets and local objects. This course focuses are larger structures which are not typically observable with hobby telescopes. Add SLOs, update text.
Units	3
Cross List	*N/A*
Typical Course Weeks	18

Total Instructional Hours

	Contact Hours
Lecture	54.00
Lab	0.00
Activity	0.00
Work Experience	0.00
Outside of Class Hours	108.00

Total Contact Hours	54
Total Student Hours	162
Open Entry/Open Exit	No
Maximum Enrollment	
Grading Option	Letter Grade or P/NP

Distance Education Mode of Instruction

SECTION B

General Education Information:

SECTION C

Course Description

Repeatability May be repeated 0 times

Catalog Description An introductory general education course on the formation, properties, evolution, and fates of celestial objects--from galaxies to planets to black holes.

Schedule Description

SECTION D

Condition on Enrollment

1a. Prerequisite(s): *None*

1b. Corequisite(s): *None*

1c. Recommended: *None*

1d. Limitation on Enrollment: *None*

SECTION E

Course Outline Information

1. Student Learning Outcomes:

A. Demonstrate an be able to explain the principles of the study of celestial objects. (How we know what we know.)
B. Demonstrate knowledge of the characteristics of the different kinds of celestial objects.
C. Describe conceptual models related to the formation, evolution and fates of galaxies, stars, planets, comets, meteors, and black holes.

2. Course Objectives: Upon completion of this course, the student will be able to:

A. Describe the principle characteristics of each type of celestial object; asteroids, black holes, comets, galaxies, etc.
B. Describe the stages of formation, evolution, and death of each type of celestial object, including the stages of stellar death, how stars produce energy, where comets come from and go to, etc.
C. Demonstrate an improved comprehension of the magnitude of the speed of light and the immensity of interstellar and intergalactic distances; apply this comprehension to questions of future space travel and communication.
D. Describe the current theories concerning the beginning, history, and possible future of the universe; give key evidence for these theories.
E. Describe the major methods for determining the distances to stars and galaxies; demonstrate a working knowledge of the H-R diagram and spectroscopic parallax (using intrinsic variables).
F. Find (especially in a library) good (current, readable, reliable) sources of astronomical information (of the type presented in this class) and be able to read this material with understanding.
G.

3. Course Content

A. How we know what we know? the nature of light and other electromagnetic waves. Instruments: reflecting, refracting (inc. binoculars), combination telescopes; radio telescopes; high energy (UV, X, Gamma) detectors.
    a. image formation, light-gathering-power, magnification, resolving power, atmospheric distortions and absorptions.
    b. the near future - multimirror telescopes, multiple radio telescopes, space telescopes, as well as southern hemisphere instruments.
    c. spectral analysis; the Doppler Effect.
B. The vastness of space. The speed of light; Einstein and Relativity. Measuring distances using the speed of light. How far to anyplace? The distances to stars, across the galaxy, to distant galaxies, to quasars. The likely future of interstellar travel and communication.
C. The origin/formation, evolution, characteristics, and likely fate of solar system objects - planets (including earth), satellites, asteroids, meteors, comets, and the sun. The requirements for the formation, evolution of life; is there life in space? The sun's visible features - spots, flares, prominences.
D. The origin/formation, evolution, characteristics, and likely fate of stars, small groups (binaries), open and globular clusters, nebulae, and galaxies (incl. quasars). How stars produce energy. The creation of elements. Stellar evolution, including protostars, main sequence, red giants, intrinsic variables, white dwarfs. Star death: supernovae and their remnants, planetary nebulae, neutron stars, pulsars, black dwarfs and black holes.
    a. Determining the distances to stars and galaxies: intrinsic variables, the H-R diagram, spectroscopic and heliocentric parallax, red shift. Star motion.
E. Cosmology. The history and likely future of the universe. The Big Bang, expanding universe, background radiation. Are there other universes?
F. Misc. Sources of current information (well written) about astronomy; magazines and books; use of library.
G.

4. Methods of Instruction:

Activity:
Directed Study:
Discussion:
Lecture:
Observation and Demonstration:

5. Methods of Evaluation: Describe the general types of evaluations for this course and provide at least two, specific examples.

Typical classroom assessment techniques

Exams/Tests --
Quizzes --
Papers --
Final Exam --

Additional assessment information:

Three or four major examinations (including the final exam). Short announced quizzes. A short library (reading plus paper) assignment.

Letter Grade or P/NP

6. Assignments: State the general types of assignments for this course under the following categories and provide at least two specific examples for each section.

A. Reading Assignments

Students are required to read the assigned textbook and separate handouts which are provided by the instructor. The students are expected to read and study their class notes regularly. In addition, two reading assignments are given -- one from Astronomy magazine and one from a library book.

B. Writing Assignments
Students will write a report on a magazine article and one on a library book. In class note taking (writing) is essential for success in this class.

C. Other Assignments
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7. Required Materials

A. EXAMPLES of typical college-level textbooks (for degree-applicable courses) or other print materials.

Book #1:

Author:	Gallant, Roy
Title:	National Geographic Picture Atlas of Our Universe
Publisher:	National Geographic Societ
Date of Publication:	1994
Edition:	Revised Edition

Book #2:

Author:	Micheal A. Seeds
Title:	Foundations of Astronomy
Publisher:	Brooks Cole
Date of Publication:	2012
Edition:	12th

B. Other required materials/supplies.