

Course Syllabus

Department: Science-Technology

Date: December 13, 2012

I. Course Prefix and Number: SCI 151

Course Name: Introduction to Astronomy

Credit Hours and Contact Hours: 3 Credit Hours, 4 Contact Hours

Catalog Description

A survey of the mechanics of the solar system as they are interpreted by current astronomers. This course includes study of the motions of the earth, time and concepts and determination, planetary motions and characteristics, and general structure of the solar system as it appears to be at the present time.

Relationship to Academic Programs and Curriculum including SUNY Gen Ed designation if applicable:

This course is a college level course that fulfills elective mathematics/science course requirements for all A.A., A.S., and A.A.S. degree programs. Each student should verify the appropriateness of this course for his/her program with his/her advisor.

II. Course Student Learning Outcomes: Upon completion of this course, the successful student must demonstrate:

- an understanding of the basic assumptions of science and how science works.
- an appreciation for the evolution of astronomical knowledge, including some understanding of how ancient cultures viewed the cosmos and to what use their knowledge was put.
- the ability to explore natural phenomena, especially the sky, in the course's laboratory component.
- the ability to identify and describe all major components of our solar system including the sun, planets and their moons, asteroids, meteors and comets, Kuiper belt and Oort cloud.
- The ability to observe, measure and demonstrate an understanding of the basics of celestial motions, including the causes of the seasons, day and night, phases of the moon, lunar and solar eclipses, and orbital motions in general.
- The ability to determine the best method of detection, as well as the best placement of the detection device, for any given celestial object given its wavelength of maximum output.

- the ability to describe the different types of stars, their life cycles, and their ultimate fates.
- the ability to define and/or recognize the various “families” of astronomical objects including open and globular star clusters, various nebulae, double stars, supernova remnants, galaxies, quasars, pulsars and black holes.
- The ability to differentiate between the various types of galaxies using the Hubble “tuning fork” diagram, and an appreciation for galactic evolution.
- the ability to discuss theories on the nature, origin and fate of the universe.
- an understanding of the current search for extrasolar planets.
- a basic understanding of the current search for intelligent life in the universe.

College Learning Outcomes Addressed by the Course:

- | | |
|--|--|
| <input type="checkbox"/> writing | <input type="checkbox"/> computer literacy |
| <input type="checkbox"/> oral communications | <input type="checkbox"/> ethics/values |
| <input type="checkbox"/> reading | <input type="checkbox"/> citizenship |
| X <input type="checkbox"/> mathematics | <input type="checkbox"/> global concerns |
| X <input type="checkbox"/> critical thinking | <input type="checkbox"/> information resources |

III. Assessment Measures (Summarize how the college and student learning outcomes will be assessed)

List identified College Learning Outcomes(s)	Specific assessment measure(s)
Critical thinking	Students will apply data, concepts, and models, in the field of astronomy, by how they answer the questions on quizzes, exams a a comprehensive final
Mathematics	Quantitative arithmetic will be required.

IV. Instructional Materials and Methods

Types of Course Materials:

- Textbook: Selected by department.
- Scientific Calculator: Specified by instructor.
- Supplementary material: Specified by instructor.

Methods of Instruction (e.g. Lecture, Lab, Seminar ...):

Lecture, discussion, group activities, online resources, AV materials, in-class labs, and readings.

V. General Outline of Topics Covered:

Topics include:

- the scale of the cosmos
- modeling the night sky and its motions
- the history of astronomy, constellations, astronomical cycles including those of the sun (seasons) and moon (phases), solar and lunar eclipses
- telescopes and other methods of detection
- stars and the “lives” they live (stellar evolution), our star-the sun, multiwavelength astronomy, planetary systems (with an emphasis on our own and its formation)
- the search for extrasolar planets, galaxies and their evolution
- the nature and structure of the universe as a whole
- the search for life (intelligent and otherwise), and the nature of scientific inquiry
- There will be observations of the night sky (naked eye and telescopic), when the weather permits, and/or indoor web-based “labs” every class meeting

7/12