Prepared by Department of Natural Sciences & Applied Technology
Date of Departmental Approval: February 15, 2017
Date Approved by Curriculum and Programs: February 22, 2017 Effective: Fall 2017

1. **Course Number: AST101 / AST101L**
   Course Title: Fundamentals of Astronomy
   Fundamentals of Astronomy Laboratory

2. **Description:** A one-semester science course, with laboratory, that provides an introduction to the principles and theories of contemporary astronomy within and beyond the solar system. The course traces the pathways of observation, conjecture, thought, investigation and discovery to demonstrate how scientific inquiry has enabled the human mind to attain an unprecedented insight into the nature of the universe. (3 class hours/2 laboratory hours)

3. **Student Learning Outcomes: (instructional objectives, intellectual skills):**
   Upon successful completion of this course, students are able to do the following:
   - Describe the basic historical development of Astronomy as a discipline.
   - Effectively utilize appropriate distance and time units in describing the cosmos.
   - Describe the various distance measuring techniques used in astronomy, and the scales in which they are used.
   - Use appropriate laboratory techniques, collect and analyze meaningful data, and present coherent laboratory results within a provided framework.
   - Sketch the main types of telescopes, and describe their strengths and weaknesses.
   - List and describe the various types of objects in the Solar System.
   - Compare and contrast the Terrestrial and the Jovian planets.
   - Name the major objects (star, planets and large moons) in the Solar System.
   - Describe the Sun, identify its layers.
   - Differentiate between different stellar types, and describe their life cycles.
   - Compare and contrast the various “exotic objects” in the cosmos (Neutron Stars, Black Holes, etc.).
   - Compare and contrast the types of galaxies, their distribution and possible evolution.
   - Describe the overall size and discuss the overall history of the universe.
   - Work cooperatively in a small group setting to complete various laboratory exercises, following the written instructions provided.
   - Use a variety of devices and instruments in taking laboratory measurements.
   - Use word processing and spreadsheet software to prepare and present laboratory reports.

4. **Credits:** Four credits

5. **Satisfies General Education Requirement:** Natural or Physical Science

6. **Prerequisite:** MAT030 (Elementary Algebra) or MAT035 (Algebra for Non-STEM), ENL108 (Critical Reading & Thinking) or satisfactory basic skills assessment scores

7. **Semesters Offered:** Fall, Spring, and Summer

8. **Suggested General Guidelines for Evaluation:** Course grading procedures and make-up policies are detailed in a student handout. In summary, 75% of the course grade evaluation is based on achievement in the lecture portion of the course, while 25% is based on the laboratory portion of the course.

9. **General Topical Outline (Optional):** See attached.

Fundamentals of Astronomy
AST101

1. Introduction to the Solar System
2. The Terrestrial Planets
3. The Jovian Planets
4. Meteorites, Asteroids and Comets
5. The Scale of the Cosmos; Celestial Motions
6. A Brief History of Astronomical Thought and Theories
7. Light and Telescopes
8. The Sun as a Representative Star
9. Properties and Classification of Stars
10. Stellar Birth, Evolution and Death
11. Stellar Remains, Neutron Stars, Pulsars and Black Holes
12. Galaxies and the Age and Origin of the Universe
13. Cosmology and the Fate of the Universe.