

## **ASTR 124: The Solar System**

### **Course Description**

Introduction to the scientific study of our Solar System and Earth as a planet. Topics include scientific methodologies, object classification, planetary environments and components, formation and evolution of the Solar System, space science, space exploration and the search for life in the Solar System. (3 credit hours)

### **Course Objectives**

Students will be expected to demonstrate knowledge of the current state of our planetary system based on simple observations, math and physical laws. They will compare and contrast space science and space exploration and their roles in providing this information and discuss the impacts of these modern technologies on our lives now and in the future.

### **Course Rationale**

This course provides a broader perspective for understanding global climate change and the value of space exploration/colonization in the context of “spaceship Earth”. It challenges students to understand the need for both applications of physical laws and value judgments in making policy decisions. An introduction to scientific methodologies and basic physical laws will provide insight into the process of collecting information about the bodies that populate the Solar System. The Sun will be examined in the context of energy production and Solar-Terrestrial interactions. Our planet will serve as a prototype body in the discussion of other solar system objects. The potential for space exploration and colonization will be explored in the context of the challenging physical environments that exist on celestial bodies beyond Earth. These topics are key elements in science literacy in a modern democratic society.

### **Course content, format and bibliography:**

#### *Content*

Topics to be addressed in this course include:

1. Introduction & The Night Sky
2. Planetary Rotation and Revolution (Time and Calendar)
3. Celestial Motions/Classification
4. Gravitation & Space Travel
5. Light & Thermal Radiation
6. Spectroscopy & Matter
7. The Sun (Solar cycles and variability)

8. Terrestrial Planets & Moons
9. Gas Giant Planets
10. Other Solar System Objects & Collisions
11. Potential Habitats for Life in the Solar System
12. Planetary Systems around Other Stars
13. Space Science and Space Exploration
14. Astronomical Factors in Global Climate Change

*Format*

This course will use a combination of lectures, demonstrations, audio-visual materials, in-class activities, planetarium presentations, homework and oral and written student presentations to achieve course goals.

*Bibliography*

Typical textbooks include, but are not limited to (newer editions may be available):

“The Solar System, Eighth Edition” Michael Seeds and Dana Backman, 2011, Brooks/Cole Publishers.

“In Quest of the Solar System” Theo Koupelis 2011, Jones and Bartlett Publishers, LLC

“Astronomy Today Volume I: Solar System” Eric Chaisson and Steve McMillan, 2008, Pearson Education, Inc Publishers

“Universe: The Solar System” Roger Freedman and William H. Kauffmann III, 2008, W. H. Freeman Publishers.