GEOL 2730: Introduction to Planetary Science

A. COURSE DESCRIPTION

Credits: 4
Lecture Hours/Week: 0
Lab Hours/Week: 0
OJT Hours/Week: *
Prerequisites: None
Corequisites: None

MnTC Goals: Goal 03 - Natural Science

An introduction to the solar system and its components. The course includes a discussion of missions, devices, and technologies for its exploration. It also involves the study of star evolution, laws, and principles for movement of celestial objects: planets, satellites, asteroids, comets, and meteorites. Analysis of physical characteristics and geological features of planets and moons of the solar system. Introduction to exoplanets and the search for life. Finally, a discussion of the solar system evolution, Planet Earth's future and human influence is included. Lecture and laboratory. [Core Curriculum Goal Area 3 (LC)]

B. COURSE EFFECTIVE DATES: 12/03/1997 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Origin of the Universe and the solar system
2. The solar System and its planets: motions and forces
3. Earth as an Analog: Topography, Geology, Plate Tectonics and Vulcanism
4. Intro to Remote Sensing, NASA missions in the solar system, and instruments
5. Star Evolution and the Sun
6. Asteroids, Meteoroids and Meteorites and Asteroids
7. Satellites and Comets
8. Terrestrial Planets
   Mercury, Venus and Mars
9. Satellites of Terrestrial Planets
10. Jupiter and Saturn
11. Jupiter and Saturn's moons
12. Uranus, Neptune
13. Dwarf Planets
14. Exoplanets
15. Future of planet Earth
D. LEARNING OUTCOMES (General)

1. explain the origin of the Universe, the solar system and Earth.
2. describe the composition of planet Earth and its processes: Climate, Plate Tectonics, Volcanism, and their topographic representation.
3. name the most important missions to study the solar system and explain the basic principles of functioning of selected sensors and devices.
4. demonstrate an understanding of the basic laws and principles pertaining to the study of the components, features and phenomena of the solar system: Gravity, Kepler Laws
5. describe the origin and evolution of Stars, especially the Sun and the solar system.
6. describe the classification criteria, main physical characteristics of meteorites and asteroids of the solar system, and their interaction with planets of the solar system.
7. describe the composition, physical properties, and comparative evolution of terrestrial planets of the solar system.
8. describe the gas planets, dwarf planets and their physical properties.
9. describe the satellites of each planet, their physical characteristics, and the importance of selected ones in the exploration of life.
10. describe what are exoplanets, their classification, and the importance in search for Earth-like Planets.
11. demonstrate an awareness of humankinds' critical responsibility to be successful stewards of Earth's resources as well as Earth's proper context in the Solar System.

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

Goal 03 - Natural Science

1. Demonstrate understanding of scientific theories.
2. Formulate and test hypotheses by performing laboratory, simulation, or field experiments in at least two of the natural science disciplines. One of these experimental components should develop, in greater depth, students' laboratory experience in the collection of data, its statistical and graphical analysis, and an appreciation of its sources of error and uncertainty.
3. Communicate their experimental findings, analyses, and interpretations both orally and in writing.
4. Evaluate societal issues from a natural science perspective, ask questions about the evidence presented, and make informed judgments about science-related topics and policies.

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted