

## NEW COURSE FOR FALL 2004

### **ORIGIN AND EVOLUTION OF PLANET EARTH AND ITS SYSTEMS**

#### **GEOL 701a – General Geology (1 – 5 units)**

**Call Number: 79718** (maximum 10 students)

**Instructor: Dr. James V. Taranik**  
**Regents Professor and**  
**Arthur Brant Chair of Geophysics**

**Day/Time: Thursday 1:30 – 2:30PM is scheduled in LMR 355,**  
**other lecture times TBD by student schedules.**

**Location: LMR 355, Adjacent to Dr. Taranik's Office**

**Prerequisites: NONE** (Senor level undergraduate students may  
enroll in this course under GEOL 495, section 7,  
with permission of the instructor and their advisor)

**Course organization and content:** This course will be given in seminar and discussion format. A comprehensive syllabus will outline current and key literature dealing with the latest theories regarding the origin and evolution of the Earth and its systems. Students may take this course for 1 – 5 semester credits. Credits given will depend on the amount of work done during the course. Students will be given an opportunity for classroom participation, oral presentation, and/or a research paper on one of the subjects suggested below. At the beginning of the course, the class will discuss their interests in the topics listed below and course emphasis will be adjusted accordingly.

This course will introduce the concept of study of the Earth's major systems in the context of other planets in the Solar System. Those systems are the lithosphere, the hydrosphere (including cryosphere), the atmosphere and the biosphere. The current state of the knowledge on origin and evolution of the Universe and the Milky Way Galaxy will be reviewed in the context of the formation of the Solar System. The formation of the Solar System will be reviewed in the context of the formation of the elements needed to build planet Earth. The concept of habitable zones in the Universe, Galaxy and Solar System will be introduced in the context of the origin and evolution of planetary life. Current ideas formation of the Earth-Moon system and its evolution through geologic time will be reviewed in the context of the initial development of the inner and outer core, mantle and crust. Ideas on the origin and evolution of the Earth's atmosphere and oceans will be reviewed in the context of the changing boundary conditions for geochemical and biological systems through geologic time. The nature, origin and variations in the Earth's magnetic field will reviewed from a planetary perspective. The origin and evolution of the continental and oceanic crust will be reviewed in the context of crustal processes that influence the global climate system, rock weathering and sedimentation. Evolution and extinction of the Earth's biological systems will be reviewed in the context of the frequency of major impacts, possible effects of supernovae, and changes in the Earth's global climate system through geologic time.

