GEOL 330i-3: The Planets

BD10256_ Spring 2012 INFORMATION

**INSTRUCTOR:** **Dr. Liliana Lefticariu** (Phone: 453-7373)

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Office hours: M/W 11:00-12:00 PM; T/Th 1:00-2:00 PM, or by appointment

**COURSE DESCRIPTION**:

This course provides a general overview of the geology of the planets and moons of the solar system, their origin and history, the origin of the universe and the solar system and the search for other planetary systems and life in the universe. The geologic processes of volcanism, tectonics, weathering, and meteorite impact on the various planets will be examined and compared. A main focus of the course will be examining the methods of discovering information about the solar system involving the interdisciplinary application of the pertinent basic scientific concepts of geology, geochemistry, geophysics, meteorology, and cosmology.

**CLASS PREREQUISITES**:

Previous courses in chemistry, general geology (GEOL 111, 220, 221 or 222), or other introductory science classes are beneficial. A basic understanding of chemical principles and scientific concepts is especially helpful, although all concepts are considered without presumption of any prior knowledge.

**CLASS TIMES & COURSE FORMAT**:

Class meetings are on Tuesday and Thursday from 11:00 am - 12:15 pm in Parkinson 202; they consist of lectures and discussions sessions. A research project is required. Course grades are based on performance in four exams, laboratory exercises, final project, and on contributions to discussions during class.

**COURSE COMPONENTS AND ASSESSMENT**:

***Exams:*** There will be a total of **4 exams**, **3 one-hour-long IN-CLASS** exams during regular classesand **1 final** at the date/time scheduled by the University. Example exam questions will be provided and discussed in class. These questions may appear in the exams. All exams will be closed book and closed note exams. All exams comprise only multiple-choice type questions. Please note that each student must present their Southern Illinois University **Photo ID in order to be admitted** to the exams.

***Honor code*:** Students are expected to do their own work on exams. If you are aware that someone else is cheating, it is your obligation to inform the instructor.

***Laboratory Exercises*:**  Exercises will be performed during laboratory sessions to aid in the understanding of course material. The lab exercises should be turned in the same day. Late or incomplete labs will not be accepted. Students must attend the laboratory sessions in order to do lab assignments.

***Class discussions:*** Assessment of discussions can add bonus points to the final grade. Note: participation involves answering and asking *relevant* questions during lecture and laboratory sessions. Class attendance only does not constitute active participation in the course.

***Final Project:*** The final project in this class is to build your own planet. Each student will be required to develop their own planet that will include the following items: an internal structure, method of plate movement, an atmosphere complete with common elements, a hydrologic cycle, rocks and minerals present, and a form of life. This project will be presented in a 5-10 page paper and a 5-10 minute oral presentation. Papers will be graded on content, organization, ability to present thoughts clearly, grammar, spelling, and specifically and most importantly **CREATIVITY!**

***Attendance:***Attendance is required in lectures as well as laboratory sections.

***Grading Policy:***

Four exams 4 @ 15% = 60%

Laboratory Exercises + Semester Project 40%

Class Participation 10%

**GRADE BREAKS**: A = > = 90%; B = 75-89%; C = 65-74%; D = 55-65%; F = <55 %

**EMERGENCY PROCEDURES:**

Southern Illinois University Carbondale is committed to providing a safe and healthy environment for study and work. Because some health and safety circumstances are beyond our control, we ask that you become familiar with the SIUC Emergency Response Plan and Building Emergency Response Team (BERT) program. Emergency response information is available on posters in buildings on campus, available on BERT's website at www.bert.siu.edu, Department of Safety's website www.dps.siu.edu (disaster drop down) and in Emergency Response Guideline pamphlet. Know how to respond to each type of emergency.

Instructors will provide guidance and direction to students in the classroom in the event of an emergency affecting your location. It is important that you follow these instructions and stay with your instructor during an evacuation or sheltering emergency. The Building Emergency Response Team will provide assistance to your instructor in evacuating the building or sheltering within the facility.

**TEXT AND RESOURCES:**

*Recommended Texts:*

* **Exploring the Solar System, by** Peter Bond. Publisher Wiley-Blackwell; 1st edition (2012) ISBN-13: **978-1405134996**

[*http://www.wiley.com/WileyCDA/WileyTitle/productCd-1405134992.html*](http://www.wiley.com/WileyCDA/WileyTitle/productCd-1405134992.html)

* **Encyclopedia of the Solar System (Second Edition)**, by Edited by: Lucy-Ann McFadden Paul R. Weissman and Torrence V. Johnson. Publisher: Academic Press; ISBN-13: 978-0120885893.

**Online:** <http://www.credoreference.com/vol/557>

These books provide a general introduction to many of the course themes in a narrative format. It offers a comprehensive treatment of several of the class topics and an adequate representation of most others. Most importantly it represents a companion to the class that supplements and augments the lecture materials. Its contents are not followed directly, and topics are considered in a different order from this text.

*Additional Web Resources:*

* [**http://www.nasa.gov/home/index.html**](http://www.nasa.gov/home/index.html)
* [**http://www.lpi.usra.edu/**](http://www.lpi.usra.edu/)
* [**http://www.nineplanets.org/**](http://www.nineplanets.org/)
* [**http://www.jpl.nasa.gov/**](http://www.jpl.nasa.gov/)

**PRELIMINARY LECTURE SCHEDULE:**

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| --- | --- | --- |
| **Date** | **Schedule of Topics** | **Reading Assignments** |
| 17-Jan-12 | The Solar System and Its Place in the Galaxy | Chapter 1 |
| 19-Jan-12 | The Origin of the Solar System | Chapter 2 |
| 24-Jan-12 | Earth as a Planet: Surface and Interior | Chapter 10 |
| 26-Jan-12 | Earth as a Planet: Surface and Interior | Chapter 10 |
| 31-Jan-12 | Earth as a Planet: Atmosphere and Oceans | Chapter 9 |
| 2-Feb-12 | Earth as a Planet: Atmosphere and Oceans | Chapter 9 |
| 7-Feb-12 | EXAM #1 |  |
| 9-Feb-12 | Sun | Chapter 4 |
| 14-Feb-12 | The sun—earth Connection | Chapter 11 |
| 16-Feb-12 | Mercury | Chapter 6 |
| 21-Feb-12 | Venus: Surface and Interior | Chapter 7&8 |
| 23-Feb-12 | Venus: Atmosphere | Chapter 12 |
| 28-Feb-12 | The Moon | Chapter 12 |
| 1-Mar-12 | The Moon | Chapter 13 |
| 6-Mar-12 | EXAM #2 |  |
| 8-Mar-12 | Meteorites | Chapter 13 |
| 13-Mar-12 | Spring Break | No class |
| 15-Mar-12 | Spring Break | No class |
| 20-Mar-12 | Mars: overview | Chapter 15 |
| 22-Mar-12 | Mars Atmosphere: History and Surface Interactions | Chapter 16 |
| 27-Mar-12 | Mars: Surface and Interior | Chapter 17 |
| 29-Mar-12 | Mars: Landing Site Geology, Mineralogy and Geochemistry | Web material |
| 3-Apr-12 | Main-Belt Asteroids |  |
| 5-Apr-12 | Impacts |  |
| 10-Apr-12 | EXAM #3 |  |
| 12-Apr-12 | Atmospheres of the Giant Planets | Chapter 20 |
| 17-Apr-12 | Interiors of the Giant Planets | Chapter 21 |
| 19-Apr-12 | Moons of the Giant Planets | Chapter 22&23 |
| 24-Apr-12 | GUEST LECTURE by Dr. Michael T. Madigan | Web material |
| 26-Apr-12 | Earth: Life through time | Chapter 45 |
| 1-May-12 | Life in the Universe | Chapter 46 |
| 3-May-12 | Extrasolar Planets | Chapter 46 |
| TBA | EXAM #4 |  |

**PRELIMINARY LABORATORY OUTLINE:**

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| **DATE** | **TOPICS** |
| January 19&20 | Class Introduction and Minerals Lab |
| January 26&27 | Rocks Lab |
| February 2&3 | Plate Tectonics/Earths Interior Lab |
| February 9&10 | Geomorphology Lab |
| February 16&17 | Video (Sun-Earth connection; Mercury) |
| February 23&24 | Meteorite Impact Lab |
| March 2&3 | Hydrologic Cycle Lab |
| March 9&10 | Video (Asteroids) |
| March 16&17 | SPRING BREAK (NO CLASS) |
| March 23&24 | Mars Landforms Lab |
| March 30& 31 | Earths Atmosphere Lab |
| April 6&7 | Video (Atmospheres of the Giant Planets) |
| April 13&14 | Life on the Planet Earth |
| April 20&21 | Final Presentations |
| April 27&28 | Final Presentations |
| May 4&5 | Final Presentations |