

UNIVERSITY OF TEXAS AT SAN ANTONIO
College of Education
Department of Interdisciplinary Studies and Curriculum and Instruction

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| EARTH SYSTEMS | LECTURE | SPRING 2008 |
| IDS 2413 SEC 001 | Wednesdays, 8:00-10:45pm | UTSA-1604 <u>MB 0.410</u> |
| Instructor: | Sonia Cabrera | |
| E-mail Address: | through WebCT or Sonia.CabreraLuna@utsa.edu | |
| Office Hours: | Tuesdays, 11:00am-02:00pm | MB 2.210 carrel #5 |

DEPARTMENT OF INTERDISCIPLINARY LEARNING AND TEACHING (ILT)

MISSION

The mission of the department of ILT is to foster the intellectual and professional growth and integrity of students and faculty through critical reflection and dialogue, civic responsibility, and leadership. This mission will be accomplished by nurturing a community of interdisciplinary learners who:

- Promote excellence in academic and pedagogical knowledge and research
- Engage in reflective practice
- Embody a strong professional identity and can articulate their philosophies and values
- Value diversity and multiple perspectives
- Promote equality and social justice
- Care about their students and their profession
- Advocate for educational change and reform

GOALS

The department of ILT will create a context that nurtures interdisciplinary learners who:

- Acquire and demonstrate content and discipline knowledge
- Demonstrate an awareness and acknowledgement of and engagement in research-based, reflective, culturally responsive practices
- Are producers, disseminators, and critical consumers of research
- Demonstrate an awareness and acknowledgment of and engagement in social justice and equitable practices
- Articulate their professional philosophy and demonstrate a strong professional identity

COURSE DESCRIPTION

Study of major concepts, principles, and theories in the fields of earth and life sciences and ways of scientific thinking that contribute to empirical and theoretical inquiries. Study of the origin of the planet and solar system with special emphasis on geologic time and plate tectonics and their influence on biological evolution. Topics may include but not be restricted to: atmospheric and oceanic circulation; climate changes; natural resources; biological evolution and distribution; biodiversity including specialization and adaptation; interaction and interdependence; genetic continuity and reproduction; growth, development, and differentiation; energy, matter, and organization; maintenance of a dynamic equilibrium.

Prerequisite: Completion of core curriculum requirements, including college algebra or higher math.

KNOWLEDGE BASE

The basis for this course is the *National Science Education Standards (NSES)* for science content. These standards are designed to guide the nation toward a scientifically literate society.

Founded in exemplary practice and research, the Standards describe a vision of the scientifically literate person and present criteria for science education that will allow that vision to become reality. Teachers must have theoretical and practical knowledge and abilities about science, learning, and science teaching. General science competencies for EC-4 and 4-8 in Texas (*TEKS Standards*) are correlated to the NSES and will also be addressed in the course. Lecture topics, laboratory activities and assignments are chosen to enhance and model course topics and reflect an understanding of the *National Science Content Standards* and the *Texas Essential Knowledge and Skills* for elementary and middle school science curricula. The *National Science Education Standards* can be downloaded from <http://books.nap.edu/html/nses/>. The *TEKS* can be found at <http://www.tea.state.tx.us/teks/>

COURSE OBJECTIVES

As caring, responsible and scientifically literate persons, students enrolled in this course will be able to:

1. **Exhibit a holistic understanding of Planet Earth, recognizing that it is a system comprised of changing and interacting subsystems;**
2. Demonstrate an aesthetic appreciation of, and respect for, the beauty and value of the Earth, its grand cycles and its life;
3. Exhibit a holistic understanding of individual organisms, recognizing that each is a system comprised of changing and interacting subsystems, and that each is also a part of environmental processes;
4. Demonstrate an awareness that humans are unique, that our activities may seriously impact Planet Earth, and that individually and collectively we have the responsibility to make informed decisions on issues affecting the future of our planet and its inhabitants;
5. Demonstrate wise use of Earth's limited resources;
6. Access, sort, interpret, analyze, evaluate and apply information from a wide variety of sources;
7. **Use current technologies as tools to access and process information about the Earth's systems;**
8. **Demonstrate skills for engaging in individual and collaborative scientific and social endeavors;**
9. **Demonstrate effective communication skills within the context of science;**
10. Show an understanding of the basic concepts and principles of science, and apply them to identify issues, solve problems, make decisions and understand the world;
11. Participate in "hands on" and inquiry-based activities in classroom and field settings; and,
12. Participate in classroom and outside experiences, assignments, and activities that promote the *National Science Education Standards* and the *TEKS*.

CONCEPTUAL FRAMEWORK

Earth is Whole: "One of our civilization's major discoveries is that we live on a round planet. Today we are in the middle of a more awesome discovery about the nature of our home. Earth is not flat. Earth is not round. Earth is whole."

"Earth is Whole" means that all the planet's physical features and living organisms are interconnected. They work together in important and meaningful ways. The clouds, oceans, mountains, volcanoes, plants, bacteria and animals are all functioning parts of Earth's Operating System.

Systems within Systems within Systems: *"We use the word "system" when we want to describe something that is made up of different kinds of parts that join together to form an interconnected whole. Learning to think in terms of systems is very useful because we are surrounded by all sorts of systems. In fact, each of us is our own little system."*

The Earth System: *"In examining Earth as a whole, we use systems thinking to focus on Earth's matter, Earth's energy and Earth's life. In other words, we are going to examine from a systems point of view the stuff (matter) that exists on planet Earth, the energy that makes things happen on planet Earth, and the organisms that make our planet unique in the solar system."*

(Excerpts from Dr. Art's Guide to Planet Earth by Art Sussman)

GENERAL SCHEDULE

| Spheres | Parts | Chapters |
|---------------|---|--|
| Intro/SYSTEMS | THE EARTH IN SPACE | 1. The Earth System 2. Fellow Travelers in Space: Earth's Nearest Neighbors 3. The Sun, Giver of Life |
| GEOSPHERE | THE EARTH BENEATH OUR FEET | 4. The Rock Cycle and Plate Tectonics 5. Earthquakes and the Earth's Interior 6. Earth Materials: Minerals and Rocks 7. The Heat Within: Magma and Volcanoes 8. The Earth's Evolving Crust |
| HYDROSPHERE | THE EARTH'S BLANKET OF WATER AND ICE | 9. Water on the Land 10. The World of Snow and Ice 11. The World Ocean |
| ATMOSPHERE | THE EARTH'S GASEOUS ENVELOPE | 12. Composition and Structure of the Atmosphere 13. Winds, Weather, and Deserts 14. The Earth's Changing Climates |
| BIOSPHERE | THE DYNAMIC OF LIFE ON EARTH LIVING ON THE EARTH | 15. A Planetary Perspective on Life 16. Geochemistry and Life 17. Biological Evolution and the History of the Biosphere 18. Resources of the Earth 19. The Changing Face of the Land 20. Global Change: A Planet Under Stress |

METHODOLOGY

Class discussions and activities will be hands-on, inquiry-based activities, utilizing whole group discussions, cooperative learning groups, and some individual projects. Lecture experiences will be designed around the learning cycle format (exploration, concept formation, and expansion), emphasizing the science process skills in discussions and demonstrations. Video-tapes, case studies, field trips, guest speakers, small and large group discussions, and the Internet will be utilized to support class activities.

USE OF TECHNOLOGY

Technology is recognized as not only an important methodology to utilize in the classroom, but in today's classroom, a necessary tool. Therefore, various forms of technology as instructional tools will be modeled in this course. This will include, but not be limited to, video tapes, overhead projectors, WebCT, Internet resources, WebQuests, and computer software. The use of the computer will be **required** in the writing of all written work submitted for evaluation.

Communication will occur periodically individually and as a class using electronic sources. WebCT provides a rich source for communication and idea exchange. Weekly agendas, syllabus, course materials and readings, updates, and announcements are available on this site. Please visit the site ASAP to become familiar with its tools. It is **your** responsibility to monitor the site on a regular basis.

REQUIRED COURSE MATERIALS

1. The Blue Planet. 1999. Skinner, Porter, and Botkin. John Wiley & Sons, Inc. Available at UTSA bookstore.
2. WebCT: Schedules, updates, links to selected sites, lecture outline, and other information will be posted on the WebCT. WebCT is subject to frequent revisions/postings. **Check the WebCT on a regular basis.**

COURSE REQUIREMENTS

Students are expected to complete all of the following:

1. Tests -Chapter Reviews

(Individual: 500pt)

In preparation for each class, students will be **required to read the corresponding chapter(s) from The Blue Planet**. There are 20 chapters to be covered and 5 individual tests. All the questions are multiple choice –ParSCORE form X-101864 (PAR-L green and red). The dates and chapters for the tests are given on the class schedule and posted on WebCT.

4. Participation –(Individual/ Group Evaluations, Attendance)

(Individual/Group: 100pt)

-Individual participation: Participation includes contributions to discussions, responsibility for readings and assignments, and attendance.

-Group evaluations: Several of the class assignments are done with peers. Each group is expected to work effectively to complete assignments and each student is expected to participate fully as a group member.

-See also: Attendance Policy

5. Final Exam

(Individual: 200pt)

Each chapter identified in the weekly schedule will be discussed in class and summary notes of each chapter will be posted on WebCT. You will have an opportunity to be involved in one or more activities that extend the chapter content material. At the conclusion of the semester, you will be given a comprehensive exam of the content material covered in the chapter readings and class activities.

All the questions are multiple choice –ParSCORE form X-101864 (PAR-L green and red).

**4. Project 1 -Science Resource File
(Group: 100pt)**

For Projects 1 &2: Students will work in groups consisting of four participants. Each participant will take an active role in the project. Choose your group carefully as these will be GROUP grades, not individual grades.

The project will consist of selecting an Earth Systems Science topic, and designing a resource file with suitable experiments/activities for the topic, appropriately correlated to the EC-4 or 4-8 TEKS science standards.

Each group will present their resource file at a “Share Fair.”

Details and instructions for project 1 will be posted on WebCT.

**5. Project 2 -WebQuests
(Group: 100pt)**

The Internet is a treasure trove of Earth science data, illustrations and photos, maps, and movies. Use of the World Wide Web can enrich your study of the Earth system by providing such visual and written information as satellite images, accounts of the most recent volcanic disaster, animations of ocean currents, and videos of landslides, floods, and hurricanes.

Each group will complete four guided, inquiry-based Internet exercises known as a WebQuest.

Details and instructions for the project 2 will be posted on WebCT.

ASSESSMENT AND EVALUATION

| | <i>Assignment</i> | | <i>Pt Value</i> | <i>% of Grade</i> |
|---|--------------------------|---|-----------------|-------------------|
| 1 | Tests (5) | I | 500 | 50% |
| 2 | Participation | I | 100 | 10% |
| 3 | Final Exam | I | 200 | 20% |
| 4 | Project1 - Resource File | G | 100 | 10% |
| 5 | Project2 -WebQuests | G | 100 | 10% |
| | | | 1000 | 100% |

I: Individual; G: Group

| <i>Grading Scale</i> | | |
|----------------------|-----|------|
| A | 900 | 1000 |
| B | 800 | 899 |
| C | 700 | 799 |
| D | 600 | 699 |
| F | 0 | 599 |

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ATTENDANCE POLICY

Class attendance and promptness is mandatory. The preservice teacher is preparing for a profession where attendance, promptness, and being well prepared and organized are vital. ~~In addition, because this is a hands-on class, many instructional strategies will be demonstrated and lecture will be kept to a minimum. Learning by borrowing someone else’s class notes will be~~

~~nearly impossible. It is therefore imperative that you be present, timely, and involved in all aspects of the course. Attendance will be monitored at all class meetings.~~

Absences from class will directly affect your participation grade. ~~Since this class is once a week for about three hours, attendance will be taken twice, at beginning and end of class, and each of those times will count as a separate absence.~~ You will be allowed TWO “free” absences for the semester that will not affect your grade (100pt). For excused absences, which are defined as those that the instructor has approved, students will receive half the class points (50pt). Three or more absences will leave you with no points at all.

Note: It is expected that for every hour spent in class, twice that amount of time should be spent outside of class on assignments, readings, and class preparation. If you find yourself unable to complete course requirements in a timely manner, refer to the university withdrawal policy and dates. Incomplete grades are infrequently given and are only given for dire emergencies. Becoming “overloaded” does not count as an emergency.

PROFESSIONALISM

An important part of this course is the growth students make toward becoming professional educators. Students are expected to submit work that represents their best effort. All assignments must conform to university policies governing academic dishonesty. All work submitted must be edited for grammar, spelling and correct sentence structure. Materials submitted in this class will be typed, double-spaced, single sided, 12 pt. font, and 1-inch margins). The instructor reserves the right to deduct points from any assignment that does not conform to professional writing standards.

CLASS PARTICIPATION

An important requirement of this course is active participation in class lectures, experiments, and activities. It is expected that you will be prepared for each class period.

Absences and inadequate preparation cannot be made up. All assignments are due at beginning time of scheduled class. Late work will be accepted at a cost of a letter grade per calendar day late. Only with prior consent of instructor will an assignment be accepted via email. Papers, exams or projects that are late due to illness or personal emergency are accepted without deduction of points, but only when adequate documentation and approval of instructor are provided. However, in no event will papers or projects or other assignments be accepted more than 7 calendar days after the due date.

UNIVERSITY POLICIES

The University expects every student to maintain a high standard of individual integrity for work done. Scholastic dishonesty is a serious offense, which includes, but is not limited to, cheating on a test or other class work, plagiarism (the appropriation of another’s work and the unauthorized incorporation of that work in one’s own work), and collusion (the unauthorized collaboration with another person in preparing college work offered for credit). In cases of scholastic dishonesty, the faculty member responsible for the class may initiate disciplinary proceedings against the student. In this class all UTSA procedures will be followed and the necessary paperwork will be filed with the Office of Student life and the College of Education.

The course instructor will recommend a penalty to the Office of Student Life, which may impose an additional university penalty.

ACCOMODATIONS FOR STUDENTS WITH SPECIAL NEEDS

If any member of this class feels that he/she has a disability and needs special accommodations of any nature whatsoever, the instructor will work with you and the Office of Disability Services to perform in this class. Students with disabilities must be registered with the Office of Disability Services located in MS 2.03.18 (Main Campus, 458-4157) or BV 1.302 (Downtown, 458-2838). Please advise the instructor of such disability and the desired accommodations at some point before or immediately after the first scheduled class period.

FLEXIBILITY CLAUSE

Flexibility is one key to learning. The instructor reserves the right to modify or change the assignments, sequence of assignments, or weight of assignments as necessary and as reflected by the needs of individuals or the group during the semester. This course outline represents a tentative listing of information and modifications may be assigned as necessary and appropriate. **If you are not in class, you may miss important information that directly affects your grade!**

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SCL, Spring 2008 (based on Dr. C. Moseley and Dr. S. Kochat's syllabi). Rev2:12-10-07