

## ENVS 101-501 Fall 2017 - Environmental Science: The Blue Planet

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**Office hours:** Tuesday & Thursday 9:00-10:15; Tuesday 3:00-5:00; Wednesday 1:30-5:00

**Class time and location:** Tuesday & Thursday 10:30 – 11:45 in VACTC-103

**Textbook:** *The Blue Planet* by Skinner & Murck; Wiley Publishing

**Supplies needed:** Notebook or binder with lined paper, pencils; some students prefer different colors of pens/pencils for note-taking and diagrams

### Schedule

| <u>Week</u> | <u>Date</u> |                                 | <u>Topic</u>                          | <u>Reading</u>               |
|-------------|-------------|---------------------------------|---------------------------------------|------------------------------|
| 1           | 22-Aug      | Intro-<br>duction               | Introduction; Observations            | p. 5-26                      |
|             | 24-Aug      |                                 | The scientific method; Earth Systems  | p. 26-46                     |
| 2           | 29-Aug      | Energy &<br>Atmosphere          | Solar system formation; solar energy  | p. 81-92                     |
|             | 31-Aug      |                                 | Seasonality                           | p. 84; online resources      |
| 3           | 5-Sep       |                                 | Atmospheric composition               | p. 322-333                   |
|             | 7-Sep       |                                 | Energy in the atmosphere              | p. 335-343                   |
| 4           | 12-Sep      |                                 | Atmospheric circulation               | p. 350-374                   |
|             | 14-Sep      | Ocean currents; energy transfer |                                       | p. 295-300                   |
| 5           | 19-Sep      |                                 | Water in the atmosphere               | p. 335-343                   |
|             | 21-Sep      | Water, Weather, Climate         | Air masses                            | p. 355-364                   |
| 6           | 26-Sep      |                                 | The hydrologic cycle; water resources | p. 222-250                   |
|             | 28-Sep      |                                 | <b>EXAM 1</b>                         |                              |
| 7           | 3-Oct       |                                 | Water use                             | online resources             |
|             | 5-Oct       |                                 | Glaciers                              | p. 257-276; online resources |
| 8           | 10-Oct      |                                 | The cryosphere                        | Check UNMLearn               |
|             | 12-Oct      |                                 | Glacial change in human timescales    | Check UNMLearn               |
| 9           | 17-Oct      |                                 | Oceans                                | p. 287-314                   |
|             | 19-Oct      |                                 | Earth-Atmosphere Interface            | Ocean chemistry              |
| 10          | 24-Oct      | Tectonics; earthquakes          |                                       | p. 109-132                   |
|             | 26-Oct      | Earthquakes; volcanoes          |                                       | p. 143-179                   |
| 11          | 31-Oct      | Weathering of Earth materials   |                                       | p. 185-200                   |
|             | 2-Nov       | <b>EXAM 2</b>                   |                                       |                              |
| 12          | 7-Nov       | Rock cycle                      |                                       | p. 185-215                   |
|             | 9-Nov       | Rivers                          | p. 228-238                            |                              |
| 13          | 14-Nov      | Rio Grande studies              | Online resources                      |                              |
|             | 16-Nov      | Soils                           | p. 459-474                            |                              |
| 14          | 21-Nov      | Biogeochemical cycling          | p. 450-479                            |                              |
|             | 23-Nov      | Soils &<br>Ecosystems           | Atchafalaya discussions               | "Atchafalaya" by John McPhee |
| 15          | 28-Nov      |                                 | Basics of biosphere                   | p. 417-428                   |
|             | 30-Nov      |                                 | Populations, communities              | p. 488-511                   |
| 16          | 5-Dec       |                                 | Biogeography                          | Online resources             |
|             | 7-Dec       |                                 | Evolution & diversity                 | TBD                          |
| 17          | 14-Dec      |                                 | <b>FINAL EXAM</b>                     |                              |

**A note on class schedule:** The schedule included above will serve as a general outline for the semester. Dates and topics might change as needs arise. Changes will be posted ASAP.

**Course Goals:**

1. *To introduce the principles and processes of science using environmental study as a guide.*  
Familiarity with the scientific method benefits individuals, communities, and societies.
2. *To present Earth system science and the methods by which it is studied and practiced.*  
The Earth system consists of interactions between the solid Earth, water, the atmosphere, and organisms. Each interaction might involve different processes and products, but forms a part of an observable cycle.
3. *To introduce students to the impacts of environmental processes and products on humans, both locally and globally.*  
Each of us plays a role in our environment, and we have impacts on it in addition to being impacted by it. As Earth systems scientists, we seek to understand better these impacts and to be able to make reasoned considerations of the environmental issues facing us and our society.

**Student Learning Objectives (SLOs):**

1. By evaluating a set of data, a student will define a problem, pose a hypothesis, and describe how the hypothesis can be tested.
2. Students will be able to describe what a commons is (providing examples from the geosphere, atmosphere, hydrosphere, and biosphere) and how it should be managed.
3. Students will be able to describe the atmospheric, hydrologic, geologic, and biologic processes involved in formation of significant resources (fossil fuels, metals, soils, water, stratospheric ozone).
4. Students will be able to name and describe the reservoirs and fluxes of various natural cycles (rock cycle, hydrologic cycle, carbon cycle) and evaluate how natural and anthropogenic processes and activities can change sizes of both reservoirs and fluxes.
5. Students will be able to name and describe the common features found on a weather surface map, and interpret wind directions, positions of warm and cold air masses, and locations most likely to receive precipitation.
6. Students will be able to describe the necessary constituent parts of an ecosystem and hypothesize how interactions between these parts will regulate population sizes of individual species.

**Attendance:**

Attendance is required at each class meeting. *Attendance is taken before the start of each class. To be late is to be absent.* Students with 3 consecutive absences or 4 absences overall may be dropped from the course. Students with 2 absences in the first three weeks of class will be dropped from the course. There are no excused absences. If you are forced to miss a class due to an emergency, you are encouraged to get notes and materials you missed from a classmate and read the assignment for that day.

**Grading:**

|                                       |            |
|---------------------------------------|------------|
| Tests: 3 tests worth 20 percent each; | 60%        |
| In-class and homework assignments     | 20%        |
| <u>Reading quizzes</u>                | <u>20%</u> |
| TOTAL                                 | 100%       |

|              |            |           |            |          |
|--------------|------------|-----------|------------|----------|
| Grade scale: | 98+ = A+   | 92-97 = A | 90-91 = A- |          |
|              | 88-89 = B+ | 82-87 = B | 80-81 = B- |          |
|              | 78-79 = C+ | 72-77 = C | 70-71 = C- |          |
|              | 68-69 = D+ | 62-67 = D | 60-61 = D- | 0-59 = F |

**Exams:**

Exams cover all materials covered since the last exam. Each exam is worth 20% of the total grade for the class. Exams will contain true/false, multiple choice, short answer, and interpretive questions.

**In-class and homework assignments:**

A total of 20% of the final grade will be based on in-class and homework assignments. Some of these will require discussion and/or collaboration with your classmates. Due dates for homework assignments will be posted when the assignment is given.

**Reading quizzes:**

There will be an online or in-class quiz most weeks. These quizzes will be based upon the assigned readings from the textbook and other sources. Online quizzes must be completed before class.

**Reading:**

This course covers a broad range of topics from many fields of natural science. It would be impossible to give fair treatment to all topics with lectures alone. Therefore, successful students must read from the textbook and other sources in preparation for class meetings. To encourage you to read *before* class meetings, most online quizzes will be taken from the reading materials that will be discussed in class on the due date of the online quiz. I encourage you to take notes while reading, including writing down questions that arise during reading that you would like to discuss in class. Re-reading after the class meeting has been shown to improve comprehension and success.

**Office hours:**

While my official office hours are listed at the top of this syllabus, you are welcome to stop by my office at any time. My door is always open, and I am here to help you in any way that I can. If you are having trouble catching me in my office, email or phone me so that we can arrange a meeting.

**Plagiarism and cheating:**

Discussion of ideas is a crucial skill in science, and I encourage you to talk with one another about the topics and assignments in this class. However, all work that you submit must be your own. If you use information from outside resources, such as the textbook, newspapers, the internet, or journals, you must cite it. Plagiarism will result in a "0" on the assignment. If you are concerned about what

does or does not constitute plagiarism, I'm happy to help – just ask me after class, via email, or in office hours.

**Electronic devices:**

Do not use cell phones during class, even for checking texts. Mute or turn off anything that can beep, whistle, ding, vibrate, or provide any other distraction before class begins.

In an effort to meet obligations under Title IX, UNM faculty, Teaching Assistants, and Graduate Assistants are considered “responsible employees” by the Department of Education (see pg 15 - <http://www2.ed.gov/about/offices/list/ocr/docs/ga-201404-title-ix.pdf>). This designation requires that any report of gender discrimination which includes sexual harassment, sexual misconduct and sexual violence made to a faculty member, TA, or GA must be reported to the Title IX Coordinator at the Office of Equal Opportunity (oeo.unm.edu). For more information on the campus policy regarding sexual misconduct, see: <https://policy.unm.edu/university-policies/2000/2740.html>