

**COURSE SYLLABUS**  
**BIOL3000: Frontiers of Biology**  
**Ecology Society: The Environment and Human Well-Being**  
**CSU Stanislaus / Spring 2011**

**Time:** Wednesday 6:30 – 9:10 pm

**Location:** Naraghi Hall Room 101

**Instructor:** Dr. Matthew Cover, Assistant Professor, Department of Biological Sciences

**Office Hours:** Weds 2-3 pm, Weds 9:15-9:45 pm (immediately after class!), Thursday 12-1:30 pm

**Office:** Naraghi Hall (Science II) Room 273

**Email:** mcover@biology.csustan.edu

Note: I do not have a smart phone, but usually respond to email within 24 hours. Important: write “BIOL3000” in the subject line, and include your full name in the email- otherwise your email may get mis-filed and I will not respond.

**Office Phone:** (209) 667-3603 (note: email is a better way to reach me)

**Personal Website:** <http://science.csustan.edu/cover/>

**Course Website:** Blackboard (<http://www.csustan.edu/blackboard>)

### **A. Course Basics**

Frontiers of Biology, BIOL 3000, is a 3-unit lecture course designed specifically to satisfy an upper division G.E. requirement in the natural sciences. Thus, it does not assume a background in the natural sciences or biology beyond an lower division G.E. science course. The class is intended to present non-science majors with an overview of issues in biology that are currently in the news or relevant to modern society. The specific topics that are covered vary each semester depending on current events and the particular interests of the professor. If you don't feel confident about your abilities in science, don't worry! Because this is a non-majors G.E. course, we take advantage of and celebrate the fact that the class is filled with students with diverse backgrounds and academic interests by including topics and assignments that will link to a variety of disciplines such as art, literature, history, political science, business, economics, anthropology, sociology, psychology, health sciences, communication, and other fields of science. Special note for students who are biology majors: if you began your undergraduate career prior to the 09-10 school year, you can receive upper-division credit for this course. Please be aware that this course may challenge you in different ways that more traditional science courses.

---

### **B. Course Overview**

Going about our daily lives in a modern, western society, responding to the everyday stresses of paying bills, buying groceries, and getting stuck in traffic, it is easy to forget that our **society is completely dependent upon the ecological processes** that govern our planet. The basis of our economy and our daily activities lies in our shared natural capital: the soils that sustain our agriculture, the rivers and aquifers that provide our water, the minerals and rock that provide the raw materials for the goods we consume, and the plants and animals that serve as our food. For those of us who live in cities, many of these processes remain hidden on a daily basis. Additionally, in an increasingly service-based economy, fewer and fewer of us have occupations that require a direct connection with the environment and natural resources (e.g., farming, mining, forestry, etc.). When we, as a society, become too detached from the natural processes that sustain us, there is the potential to undervalue the world's ecosystems.

The focus of this class is the importance of ecological processes in governing our natural world, and the ways that our society interacts with these processes. Some of the major themes we will explore are:

- The world's ecosystems contribute numerous **valuable services** to our society: clean water, fertile soils, genetic resources, regulation of human diseases, nutrient cycling, waste decomposition, etc. These services are not a given; if we degrade ecosystems, they no longer provide these services because the fundamental ecological processes have been altered. If we undervalue ecosystem services, they tend to become degraded or misused.
  - Humans have had a **tremendous impact on the global environment**, especially over the last 50 years. Some of the most significant changes have been the conversion of forests and grasslands into cropland, the diversion and storage of freshwater behind dams, and the loss of mangrove and coral reef areas.
  - The world contains tremendous **biodiversity**: over 1 million species of life have been discovered, and estimates of the total species diversity on Earth range from 5 million to 100 million! Of the species that have been described by science, most are only known from a few museum specimens, and almost nothing is known about their basic biology. As a result of ecosystem changes, a large proportion of the earth's biodiversity is going extinct. Most of the species going extinct are unknown to science.
  - Large numbers of people around the world live in **poverty**. Over one billion people have an income of less than \$1 a day, and several billion people do not have regular, reliable access to clean drinking water. Most people living in poverty are very dependent on ecosystems, because they make their livings through agriculture, grazing, or hunting. The regions of the world with the most wide-spread poverty, including parts of Asia, Africa, and Latin America, also tend to have the most problem with the degradation of ecosystems, harming the world's poorest people. Poverty and ecosystem degradation can be self-reinforcing, leading to a downward spiral for people and ecosystems.
- 

### C. Course Goals and Learning Objectives

The first goal of the course is to help students improve their **ecoliteracy**: an understanding of how natural systems make life on earth possible. The second goal of the course is to help students explore, challenge, and articulate their assumptions and positions about environmental problems. The third major goal is help students learn essential scientific research skills.

By the end of this course, students will be able to do the following:

1. Describe the important theories and concepts of the science of ecology, such as population growth, biomes, food webs, and the ecological niche;
2. Explain the major ecological issues facing California and the world, including water resources management,
3. Read and critically evaluate scientific literature;
4. Interpret and create graphs of scientific data;
5. Obtain and compile information from a variety of sources;
6. Understand and use the scientific process to propose hypotheses and design studies to test those hypotheses;
7. Use scientific information to form opinions about societal problems;
8. Write clear, concise arguments about environmental issues;

### The 7 Goals of Biology GE Courses:

1. Provide an overview of basic knowledge, principles, methodologies, theories, and perspectives in biology.
  2. Offer opportunities to work in groups with other students to practice effective communication about concepts and issues in biology.
  3. Provide a broad understanding and appreciation of biology and encourage continuous inquiry and lifelong learning.
  4. Provide the framework to critically evaluate and use information from various scientific sources to answer questions relevant to biology.
  5. Understand the relationships between the fields of biology, chemistry, physics, geology and other sciences.
  6. Appreciate the interdependence of humans, natural ecosystems, and the diversity of life on earth.
  7. Develop more informed and responsible citizens with respect to issues concerning the living world.
- 

### D. Class Format

Our class sessions will typically consist primarily of lecture, with other activities (discussions, quizzes, quick responses, movies, music, etc.) interspersed at regular intervals. Class runs for 2 hours and 40 minutes. Expect that we will use the entire class session each day. We will generally take a 10 minute break approximately half-way through the class at ~7:45. You can use this break to go for a walk, make a phone call, use the restroom, or eat something.

It is very important that you take good notes during class. Much of the class will be lecture-based. I use powerpoints primarily to show images and figures, with minimal notes in the slides. I will write down important terms and definitions on the overhead “elmo” projector. I do this to make sure you have time to copy it down. But you will want to jot down your own notes as well- this will be critical when

**Special note about communication with the professor:** Please come and speak with me if you have questions, concerns, or just want to talk about topics from class or wild tangents. You are encouraged to come to my office hours, or send me an email to set up another time to meet. In fact, you are required to meet with me at least once during the semester. Note that I have a busy schedule this semester, so if we cannot find a time to meet in person we may have to make do with email or a phone call. Also, I will try to get to class early and am happy to stay around afterwards to chat.

---

### E. Expectations

- Come to class properly prepared by doing the assigned readings prior to class.
- Engage the material **deeply** and **critically**. Some of the ideas may cause you to question your assumptions or values. Try not to dismiss these feelings; instead, try to be open to new viewpoints and understandings. Treat your education as if it is helping prepare you to change the world (which it hopefully is!).
- Attend every class session and participate fully. Take good notes!
- Complete and turn in assignments on time.

- Maintain the highest standards of academic integrity. This means: All work that you submit must be your own. Ideas that you borrow from other authors must be cited using a standard reference system such as parenthetical notation (MLA, APA, etc.) or footnotes.
- Do not distract yourselves and others around you by surfing the web or texting. Phones should be put away and turned off or set to vibrate during class. If you need to make an emergency phone call or text, please step out of the room. Laptops should be put away unless you need it to take notes. Please disable your wireless internet to avoid the temptation of checking email or surfing.
- During lecture and class discussion, please raise your hand to indicate you would like to speak.
- Treat the instructor and your fellow students with respect. Disparaging remarks will not be tolerated. It is good to be critical; make sure you are critical of ideas, not people.
- Be on time to class. When breaks are over, take your seat quickly and be ready to refocus.
- Take the initiative to use course and campus resources (office hours, web sites, readings, tutoring, etc.) to get the most out of the course.
- Share your own personal experiences. You have a unique personal and academic background that is special and different from everyone else in class.

**You can expect that the instructor will:**

- Do his best to provide you with a stimulating, useful, and fun course!
- Treat you with respect.
- Assign grades impartially and based on rubrics and standards.
- Be available to help.
- Return assignments and exams and post grades in a timely fashion (1-2 weeks).

**F. Readings**

All required readings will be posted on the blackboard web site or available on other websites. There are no required text books.

**G. Grades**

Grades will be based on points earned on assignments, exams, and participation, as follows:

Discussion Board (5 x 10 pts each)	50	~Every 2-3 weeks
In-class assignments and quizzes (1-5 pts each)	50	Every Class
Project 1- Ecological Footprint	20	
Project 2- Article Summary	20	
Project 3- Art Project	20	
Project 4- Letter to the Editor	20	
Project 5- Farmer's Market	20	

Midterm	50
Final Exam	50
<b>Total Points:</b>	<b>300</b>

- Grades will be assigned based on standard cutoffs (93-100% = A, 90-93% = A-, 87-90% = B+, etc.). There will not be a curve applied to the final grades, and it is unlikely that additional extra credit points will offered.
- Late assignments will be accepted, but 10% of the points will be subtracted for every day that an assignment is late.
- Requests for changes from letter grade to C/NC grading **MUST** be made May 11, 2011.

## H. Assignments

### In-class quizzes and assignments

Starting the second week of classes we will use iClickers to take quizzes and polls during class.

### Discussion Board

We will use an on-line discussion board to exchange ideas and discuss readings and class material.

You are required to participate in the discussion board. Approximately every two weeks, I will create a new **thread** that poses a question or asks for a response. You should read your classmates' posts every couple of days to stay up to date on the discussion.

### Guidelines

- Your participation in the discussion board is a permanent record of your participation. Once you submit a post, it cannot be edited or removed (except by the instructor). Make sure your contribution is your best work.
- It is perfectly fine (and good!) to disagree with someone else's opinions. When you respond, however, you should clearly state what aspect of their opinion you disagree with. Clarifying your own opinion, and identifying the particular ways that your opinions differ (and how they are similar) is a very helpful learning exercise. Personal attacks, insults, or defamatory statements will not be accepted, however. Make sure your writing comes across as a difference in opinion, not a personal attack.
- Contributions should be no longer than 250 words (about half a page of text, or 1 long paragraph or two short paragraphs).
- Posts should be considered formal writing. These are not text messages. Posts should have proper grammar, punctuation, and capitalization.
- I suggest that you write your contribution in a word-processing program prior to cutting and pasting it onto the discussion board. This way you can use spell-check (and grammar check), and carefully edit the post without worrying about being logged off.
- You can provide as many comments as you like for any given thread. I will assign a grade based on your best post for that topic.

Grading will be as follows:

**10 points** (Outstanding): Thoughtful, clear, and concise comment that brings new insight to the issue.

Makes connections to readings, lecture, other posts, and/or current events. No grammatical mistakes; very well written.

**8 points** (Good): Contains new ideas, but may lack depth or detail. Makes connections, but may be obvious or unclear. Or, minor grammatical problems.

**6 points** (Fair): Presents a simple opinion, but little evidence or personal experience to back it up. Minor or major grammatical problems.

**4 points** (Poor): Contributes no new ideas, makes no connections, and/or poor grammar

**0 points**: Offensive, completely off topic, or very poor grammar.

### Other Assignments

Guidelines for other assignments, including due dates, will be discussed in class and posted on the course website.

### Estimated Time Requirement for this Course: 8 hours/week

In-class: 2.5 hours/week

Outside of class: 5.5 hours/week total

Readings: 3 hours/week

Review lecture notes: 1 hour/week

Discussion board, projects, or other assignments: 1.5 hours/week

### Schedule

<b>Feb. 2 Class #1</b>	Introduction: Course Overview and Science	<ul style="list-style-type: none"> <li>• Syllabus</li> <li>• Science and Scientists</li> </ul>
<b>Feb. 9 Class #2</b>	Ecological Principles	<ul style="list-style-type: none"> <li>• Organismal ecology- niche</li> <li>• Population ecology- growth rates, carrying capacity</li> <li>• Community ecology- food webs, trophic cascades</li> <li>• Ecosystem ecology- energy and nutrient cycles</li> </ul>
<b>Feb. 16 Class #3</b>	The “Environmental Movement”- shifts in understanding, cultural differences **Ecological Footprint Due	<ul style="list-style-type: none"> <li>• Conservation</li> <li>• Preservation</li> <li>• Ecosystem Services</li> <li>• Environmental Justice</li> <li>• Green Washing</li> </ul>
<b>Feb. 23 Class #4</b>	Forests and Fires **Discussion Board 1 Due	<ul style="list-style-type: none"> <li>• Forest Ecology</li> <li>• Forest Management</li> <li>• Fire</li> </ul>
<b>March 2 Class #5</b>	Water I **Discussion Board 2 Due	<ul style="list-style-type: none"> <li>• A Mediterranean Hydroscape</li> <li>• Rivers and hydrology</li> </ul>

<b>March 9</b> <b>Class #6</b>	Water II **Article Summary Due	<ul style="list-style-type: none"> <li>• Groundwater</li> <li>• The Delta</li> <li>• San Joaquin River</li> </ul>
<b>March 16</b> <b>Class #7</b>	Midterm Exam Ecology and Art Ecology and Philosophy	
<b>March 23</b>	Spring Break- No Class	
<b>March 30</b> <b>Class #8</b>	Agriculture I **Art Project Due	<ul style="list-style-type: none"> <li>• Agricultural ecosystems</li> <li>• Industrial food production</li> </ul>
<b>April 6</b> <b>Class #9</b>	Agriculture II **Discussion Board 3 Due	<ul style="list-style-type: none"> <li>• Food choices</li> <li>• Pollinators</li> <li>• Pest Control</li> </ul>
<b>April 13</b> <b>Class #10</b>	Oceans **Discussion Board 4 Due	<ul style="list-style-type: none"> <li>• Drinking water</li> <li>• Dams and development</li> <li>• Oceans</li> </ul>
<b>April 20</b> <b>Class #11</b>	Biodiversity	<ul style="list-style-type: none"> <li>• Overview of life</li> <li>• Endangered species</li> </ul>
<b>April 27</b> <b>Class #12</b>	Energy **Letter to the Editor Rough Draft Due	<ul style="list-style-type: none"> <li>• Energy sources and use</li> <li>• Environmental consequences</li> </ul>
<b>May 4</b> <b>Class #12</b>	Climate Change **Letter to the Editor Due	<ul style="list-style-type: none"> <li>• Science</li> <li>• Policy</li> </ul>
<b>May 11</b> <b>Class #13</b>	Conservation and Restoration **Discussion Board #5 Due	<ul style="list-style-type: none"> <li>• Restoration Ecology</li> <li>• Environmental Monitoring</li> </ul>
<b>May 18</b> <b>Class #14</b>	Final Exam **Farmers Market Project Due	