COURSE SYLLABUS
BIOL 3000: Frontiers of Biology
Ecology and Society: The Environment and Human Well-Being
CSU Stanislaus / Spring 2010

Time: Wednesday 7 – 10 pm
Locations:
Section 1: Turlock, CSU Stanislaus campus, DBH 165
Section 2: Merced College Tri-College Center TC 4-2
Section 3: Stockton CSU Stanislaus Center A1090
Section 4: TV

Instructor: Dr. Matt Cover, Assistant Professor, Department of Biological Sciences
Office Hours: Weds 1:30-2:30, Thurs 3-5, or by appointment
Office: Naraghi Hall (Science II) Room 256
Email: mcover@biology.csustan.edu (preferred communication method; I usually respond in <24 hrs).
Note: Write "BIOL 3000" in the subject line, and make sure you include your full name.
Office Phone: (209) 664-6694
Personal Website: http://science.csustan.edu/cover/
Course Website: Blackboard (http://bb.csustan.edu)

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 a high-school level. 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 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.

By the end of this course, students should be able to:

1. Find, read, and critically evaluate scientific literature relevant to environmental issues,
2. Write clear, concise arguments about environmental issues,
3. Understand and use the scientific process to propose hypotheses, and design studies to test those hypotheses,
4. Describe basic ecological concepts, such as population growth, biomes, food webs, and ecological niche.
5. Consider complex problems from a wide range of spatial scales (microscopic to global) and temporal scales (seconds to billions of years).

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

This class is divided into four sections. Three of the sections are classroom courses (Turlock, Stockton, and Merced). The fourth is a TV course. Generally, the instructor will be at the Turlock section, although occasionally he may lead class from Stockton or Merced. In this respect, this is a distance learning class, since you may be watching a simulcast of the lecture. However, even if you are in a different location than the instructor, the two-way feed means that you are able and encouraged to take an active role in the class by asking questions and taking part in the discussion. Additionally, we will frequently have group activities where you interact with your fellow students. **This is not an online class.** Interacting with your peers and the instructor during class time is an essential part of the course. **I expect you to attend every class session at the location you are enrolled in.** Lecture videos are posted online at the CSU Stanislaus Leaning Services web site: <http://www.csustan.edu/oit/LearningServices/>. This is a great way to review portions of lecture that were confusing or you want to see again. It is not a substitute for attending class during the scheduled time, however. Note that a significant portion of your grade is based upon in-class activities and quizzes.

Special note about the TV section: The TV section is designed specifically for students who live far away from one of the three classroom locations and have difficulty with transportation. If you are enrolled in the TV section and this does not fit your situation, you should switch from the TV section to one of the three classroom locations. Contact me and I will give you an add number. Students enrolled in the TV section must **watch the class during the scheduled time**, and **must have access to the internet during the class**. You will be given special instructions for how to take part in activities, discussion, and quizzes during class time. Also, note that you **must attend one of the three class locations (Turlock, Stockton, or Merced) on March 24 to take the midterm exam**. If transportation is an issue for you, make sure that you have a plan well in advance to attend class on March 24. A missed mid-term cannot be made up.

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. 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. For those of you who don't come to the Turlock campus, email is probably the best way for us to communicate. If you want to have a lengthy conversation we can schedule a time for a phone call.

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. When instructions are given, pay especially close attention and jot down notes.
- Complete and turn in assignments on time.
- Maintain the highest standards of academic integrity.
- 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:

- Be organized
- Be available to help.
- Return assignments in a timely fashion (delivery times to other campuses may slow this down)
- Treat you with respect.
- Do his best to provide you with a stimulating, useful, and fun course.

F. Readings

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

Important sources for online readings are:

- The Millennium Ecosystem Assessment (www.milleniumassessment.org). From the website: "The Millennium Ecosystem Assessment assessed the consequences of ecosystem change for human well-being. From 2001 to 2005, the MA involved the work of more than 1,360 experts worldwide. Their findings provide a state-of-the-art scientific appraisal of the condition and trends in the world's ecosystems and the services they provide, as well as the scientific basis for action to conserve and use them sustainably."
- Plan B: Rescuing a Planet Under Stress and a Civilization in Trouble. By Lester Brown. (http://www.earth-policy.org/index.php?/books/pb/pb_table_of_contents). From the website: "Brown argues that food may be the issue that convinces the world of the need to cut carbon emissions 80 percent by 2020. Every major environmental trend from climate change to deforestation and water scarcity affect food supplies. In this completely revised edition, Brown focuses on details of the plan and how it is already emerging in the energy economy."

G. Grades

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

Discussion Board (12 x 5)	60	Every Week
In-class assignments and quizzes (12 x 5)	60	Every Class
Midterm Exam	40	March 24
Project 1 (Choose 1) Data Analysis Art Project	20	March-April
Project 2 (Choose 1) Open Space Field Study Ecological Footprint	20	April-May
Essay		May
Peer Review (2 x 5 pts)	10	
Peer Review Assessment (2 x 5 pts)	10	
Final Draft	30	
Total Points:	**250**	

- 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.

H. Assignments

In-class quizzes and assignments

During every class session, I will give you one or more assignments and quizzes. You should write these assignments on one sheet of paper that you will turn in at the end of each class.
*Note: Students enrolled in the TV section must turn in these quizzes and assignments in a text document sent via email at the time they are due in 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 each week. Prior to each class on Wednesday evening, I will create a new **thread** for that week's topic. Between Wednesday night and the following Tuesday (at 8 p.m.), you are required to post at least one comment. Throughout the week, you should read your classmates posts.

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
- Offensive language, insults, or disparaging remarks will be deleted by the instructor.
- 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.
- If you make more than one comment in a week, you will receive the higher grade of your first two comments. I will read, but not grade, any comments in addition to your first two per week.

Grading will be as follows:

5 points: Thoughtful, clear, and concise comment that brings new insight to the issue. Makes connections to readings, lecture, other posts, and/or current events.

4 points: Contains new ideas, but may lack depth or detail. Makes connections, but may be obvious or unclear. Or, minor grammatical problems.

2 points: 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 posted on the course website.

Estimated Time Requirements

In-class: 3 hours/week

Outside of class: 5 hours/week

Readings: 2 hours/week

Discussion Board: 2 hours/week

Projects and Assignments: 3 hours/week

Schedule (Tentative and subject to change)

Feb. 17 **Class #1**	Introduction to Science, Ecology	• Syllabus • Science and ecology • Modern society and ecology
Feb. 24 **Class #2**	Ecological Principles	• Organisms and the ecological niche • Population ecology/ human population • Community ecology/ food webs • Ecosystems, biomes, and services
March 3 **Class #3**	California Ecosystems: Part I	• Climate and topography • Biomes • Historical development
March 10 **Class #4**	Ecology and Human Health:	• Pollution and epidemiology • Environmental justice
March 17 **Class #5**	Water, Part I: California	• Water quantity • Water quality
March 24 **Class #6**	Midterm Exam Ecology and Art	• Midterm • Fine art • Music
March 31	No Class- Cesar Chavez Day	
April 7	No Class- Spring Break	
April 14 **Class #7**	California Ecosystems: Part II	• Forests • Fire ecology • Urbanization • Open space
April 21 **Class #8**	Water, Part II: Global Problems	• Water quality • Dams • Oceans
April 28 **Class #9**	Ecology and Agriculture	• Agricultural ecosystems • Food production
May 5 **Class #10**	Energy and Climate Change	• Sources of energy • Energy use • Air quality • Climate change
May 12 **Class #11**	Environmental Monitoring	• Bioassessment • Community-based monitoring
May 19 **Class #12**	Environmental Conservation	• Restoration ecology • Conservation biology • Ecology and economics
May 26	Finals Week- No Class	Final Draft of Essay Due