FD '02

Fall 2002
Dr. Gail Kaaialii

People & Nature and ***People & Nature Laboratory***
BI 110 & BI 110L
Syllabus

We urge that all people now determine that a wide untrammeled freedom shall remain to testify that this generation has love for the next. Nancy Newhall

Man is but a part of the fabric of life – dependant on the whole fabric for his very existence. As the most highly-developed tool-using animal, he must recognize that the unknown evolutionary destinies of other life forms are to be respected. Gary Snyder

For those persons who desire to fallow the right course of conduct, there is no supreme dharma other than abstinence from violence to living beings caused by thought, word or deed. Linda Gupta

The earth is the Lord's and the fullness thereof, the world and those who dwell therein. Psalms 24:1

One thing we know for sure. The earth was not made for man, man was made for earth. Chief Seattle

My parents taught me this – to gasp, and feel lucky. They gave me the gift of making mountains out of nature's exquisite molehills. Barbara Kingsolver

Ua mau ke ea o ka aina i ka pono. ("The life of the land can continue when things are properly in balance." Translation of M. Keoni Dudly in Man, Gods, and Nature)
Hawaii State Motto
Kamehameha III 1843

All people are my brothers and sisters and all things are my companions. Chang Tsai

It is God whom human beings know in every creature. Hildegard of Bingen

Civilization is a conspiracy . . . . Modern life is the silent compact of comfortable folk to keep up pretences. John Buchan

After you have exhausted what there is in business, politics, conviviality, and so on – have found that none of these finally satisfy, or permanently wear – what remains? Nature remains. Walt Whitman

The scientific community is no private club. In principle, and in its best and broadest sense of the words, scientific inquiry can be undertaken by anyone on almost any subject matter. W. Quine and J. Ullian

Class Schedule

Part I
People are Nature; Nature Shapes People

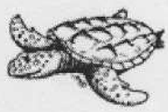
DATE	TOPIC	ACTIVITIES
8/27/02	Introduction to the course; Assessment; Defining "people" and "nature"	Assessment Pre-Test
8/28	**Lab:** Lab safety/Chemical hygiene, Scientific systems of measure	Presentation, Lab Worksheet & Video
8/29	Science: What is it? What isn't it? How is it done? Who does it? Who doesn't? Role of modeling	Chapter 3 Miller pp. 62-68 (Stop at 3-3)
———		
9/3	Belief; Structure of nature; Shared versus unique features	Chapter 4 Miller Outside reading (provided to you)
9/4	**Lab:** Nature Survey; Evidence of interdependence	Hike; Wrksht & Issue to complete
9/5	Interdependence in nature; Cycles; Causal networks	
———		
9/10	Creating biodiversity and interdependence; Evolution	Chapter 5 Miller
9/11	**Lab:** Interdependence and tolerance limits: Evidence of how you've been shaped by nature	Rhizobium and Pollution Expts set up
9/12	Speciation & extinction; Natural changes over time	
———		
9/17	Implications of tolerance limits, spacial-temporal variations and local adaptation	Chapter 6 Miller
9/18	**Lab:** Adaptation in the field	Waikiki Aquarium, wrksht, web research
9/19	Limits on life: carrying capacity; Assessing risk	Chapters 7
———		
9/24	Human health risks; What risks do we face? Risks to ecosystems	Chapter 8 Miller
9/25	**Lab:** Coliform bacterial testing; Palolo stream macropollution survey	Worksheet; Gather data from 9/11 Expt
9/26	E X A M I	

Part II
How we Believe we Fit in…

DATE	TOPIC	ACTIVITIES
10/1	Cosmogenies and view of place; Introduction to environmental ethics	Outside reading (provided to you)
10/2	**Lab:** Your own cosmogeny story and its implications for the "proper" treatment of nature	Presentation, Lab Worksheet & Video
10/3	Varieties of environmental ethics; Implications of diverse ethics for the treatment of nature	Chapter 2 Miller

10/8	Intrinsic/extrinsic value of nature; Reasons we value nature	Outside reading (provided to you)
10/9	**Lab:** Value of nature	Humane Society; Worksheet
10/10	The importance of environmental ethics	Outside reading (provided to you)

Part III
What have we done? Why have we done it?



DATE	TOPIC	ACTIVITIES
10/15	Introduction to our effect on Nature	Chapter 1 Miller
10/16	**Lab:** L A B E X A M I	**Lab notebooks due**
10/17	Our historical effect	Outside reading (provided to you)
10/22	Population growth	Chapter 9 Miller
10/23	**Lab:** Population & growth survey	Hike; Diamond Head; Worksheet
10/24	Population distribution, demographics, effects	
10/29	Feeding the world…	Chapter 15 Miller
10/30	**Lab:** Calculating your ecological footprint;	Worksheet and trip to Foodland
10/31	Pesticides and genetic engineered crops	Chapter 16 Miller
11/5	E X A M I I	
11/6	**Lab:** Yeast population growth lab	Worksheet
11/7	Air pollution; Global warming; Ozone depletion	Chapter 10 & 11 Miller
11/19	Water consumption; Water pollution	Chapter 12 Miller
11/20	**Lab:** Trash analysis	Worksheet and Issue homework
11/21	Consumption of resources; Waste	Outside reading (provided to you) Chapter 14 Miller
11/26	Losing biodiversity	Chapter 18 Miller
11/27	**Lab:** Journal article presentations	**Presentations**
11/28	T H A N K S G I V I N G B R E A K	

Part IV
What should we do now?

DATE	TOPIC	ACTIVITIES
12/3	What can we learn from what we've done? Is there a message there?	Outside reading (provided to you)
12/4	**Lab:** L A B E X A M I I	**Lab notebooks due**
12/5	The future of our relationship with nature; What should it be like? What will it be like? Why?	**Formal lab write-up due** **Term paper due** (for non-service learners)

The Final Exam for this class will be on Tuesday, December 10 from 12:45 – 2:45 in our classroom.

People & Nature; BI 110 & BI 110L
Course Introduction

Meeting time: lecture: TR 12:30 – 1:50; lab: W 2:00 – 4:50

Meeting Location: lecture: H 17; lab: H39

Instructor:
Dr. Gail Grabowsky Kaaialii ("Dr. Gail" is fine!)
Behavioral Sciences Bld, rm 107
Phone: 735-4834
E-mail address: gkaaiali@chaminade.edu

Office hours: MWF: 9:00 – 10:30; TR: 2:00-5:00, Or by appointment

Required Text:
Miller, G.T. 2001. Environmental Science. (Eighth Edition). Brooks Cole Thompson Learning, Pacific Grove, CA.
Worldwatch Institute. 2002. Vital Signs: The Environmental Trends that are Shaping Our Future. W.W. Norton & Co, New York.

Other Outside Readings and Exercises from: (These will be provided to you)
Allen, J.L. editor. 1997. Student Atlas of Environmental Issues. Dushkin/McGraw-Hill, Guilford, CT.
Allen, J.L. editor. 2000. Annual Editions: Environment 00/01. Dushkin/McGraw-Hill, Guilford, CT.
Carroll, J.E. 1997. The Greening of Faith: God, the Environment and the Good Life. University Press of New England, Hanover, NH.
Ehrlich, Anne, H. 1996. Betrayal of Science and Reason. Island Press, Washington, D.C.
Hartmann, T. 1998. The Last Hours of Ancient Sunlight. Mythical Books, Northfield, VT.
Heinberg, R. 1996. A New Covenant with Nature. The Theosophical Publishing House, Wheaton, IL.
Loban, C. S. and M. Schefter. 1997. Tropical Pacific Island Environments. University of Guam Press, Mangilao, Guam.
McConnell, R. L. and D.C. Abel. 1999. Environmental Issues: Measuring, Analyzing, Evaluating. Prentice Hall, Upper Saddle River, NJ.
Miller, G.T. 2001. Environmental Science. (Eighth Edition). Brooks Cole Thompson Learning, Pacific Grove, CA.
Orr, D.W. 1994. On Education, Environment, and the Human Prospect
Quine, W.V. and J.S. Ullian. 1970. The Web of Belief. 2nd ed. Randon House, New York.
Soule, M.E and G. Lease. 1995. Reinventing Nature: Response to Postmodern Deconstruction. Island Press.
Underwood, L. 2001. Case Studies in Environmental Science. (Second edition). Harcourt College Publishers, New York.

Union of Concerned Scientists eds. 1993. World Scientists' Warning Briefing Book. Unuion of Concerned Scientists.
Wilson, E.O. editor. 1988. Biodiversity. National Academy Press, Washington, DC.
Wynn, Charles, M. and Arthur W. Wiggins. 1997. The Five Biggest Ideas in Science. John Wiley & Sons, New York.

Course description:
Lecture (3): Addresses biological, ecological and public health questions which may have social, ethical, religious, or political implications. Recommended for non-majors.
Lab (1): Laboratory work such as testing for water quality, field trips to aqualculture farms, estuaries, and the like.

Course Introduction:

This course is about precisely what the title says. Its an investigation into the relationship between people, and nature. Don't worry about just what "people" or "nature" mean for the moment, that's something we'll need to decide on in class, just suffice to say that we, after having defined the two to some level of satisfaction, will investigate their relationship. Why do this, you wonder? My personal answer is that it is a very interesting (said with a mock Einsteinian accent) relationship: its one that is not certain, nor agreed upon, yet one that is nevertheless *really* important. Some argue that it is most important that we – all *Homo sapiens* – understand our relationship to the rest of the "natural" things around us, that have been around us since we began (like air, food, other creatures, sunlight…), because we absolutely cannot live without them. Thus the way we treat nature can have a great effect on our very selves, for better and for worse, and therefore looking into our relationship, what we have done, what we are doing and what we might do in the future, is actually not only just interesting but of central importance to our well being and the well being of future generations.

When I say we will be "investigating" our relationship with nature I mean we will be learning about it, experiencing it first hand and even doing something about that relationship. So this is not a course where only the mind is engaged, your body and "soul" may also see some action in this class.

One of the mechanisms we will use to investigate our relationship with nature will be science. We will use science as a tool for understanding our relationship with nature and our place in nature. But science has its limits; it alone cannot fully circumscribe all of the dimensions of our relationship with nature. So since I want to you to exit class with a complete picture of all of the dimensions of our relationship with nature, we will also step outside of the bounds of science in this class to briefly consider our emotional, psychological, spiritual and ethical relationships with nature and the roles these play in determining our treatment of nature. There are other courses you can take at Chaminade which more fully investigate each of these other, non-scientific, dimensions of our view of place and experience of nature.

I have divided the course into four sections which I believe represent four important aspects of our connection with nature. These sections are: **I. People are Nature; Nature Shapes People**. In this introductory section of the course you will learn the scientific method, the nature of scientific beliefs and the limitations of science as a method of inquiry about reality. Then we'll use this tool to see how we fit in with nature and how nature itself has affected and shaped us. In section **II. How We Believe We Fit in…** after having gained a "clear view" from science how we do fit in, we'll have some fun and investigate a number of the different ways we believe we fit in. These beliefs are not typically forged out of knowledge gained from science so some of them may seem "wild" or "out there" or wonderful, to you. These beliefs are very important in that they illustrate who we think we are in the grand scheme of things and they partly determine how we treat all the stuff beyond our skin. In section **III. What Have We Done?** We will have a look at how we have effected nature past and present. We have much to choose from in this section! I have selected a number of topics but am leaving a number of other topics up to you to choose. Finally, in Section **IV. What Should We Do Now?** We'll determine what we think we need to do now, if anything, knowing our place in and our effect on nature. We'll look particularly into those changes we think we should make that involve science, through technology or inquiry.

Required and Recommended Course Supplies:

1. **Required:** Lab notebook: This must be a separate notebook from whatever you use to keep your lecture material from this course in. You will be receiving lots of separate handouts and reading materials for the lab so the notebook should be one that you can easily add materials to. The purpose of the notebook is to provide a place for you to record data, make observations, keep lab protocols, file returned documents, etc. It is a precious record of your work. It will be collected twice by Dr. Gail because I love to see these and I want to help you help yourself to be organized by giving you some incentive to be organized (i.e. a notebook check!).
2. **Required:** Outdoor "field" clothing: You'll need to have something to cover your feet that can get wet and/or muddy. A bottle of mosquito repellant is a good idea too!
3. **Required:** Bottled water: We can't have you getting dehydrated, so keep a bottle of water (*at least* a half liter) handy that you can bring to labs when we are going out "into the field." If you come on a service outing always bring *at least* a liter of water with you.
4. **Recommended:** Lecture notebook: You can technically use whatever you want but I have noticed that no notebook or a pee chee folder stuffed with papers and notes from the class in random order don't really work very well…. I suggest having a notebook where your notes are entered in time-order so that you can study from them in order! This will greatly help your performance in class. Also make sure you have some way to keep track of handouts and keep them with the lectures/labs they go with.

Course Objectives:

Lecture:

When a you complete this course you should:

- ☺ **Know what science is**
- ☺ **Know how science is done**
- ☺ **Understand how science has helped us to understand our place in nature**
- ☺ **Know the limitations of science in defining our relationship with nature**
- ☺ **Know the structure of nature from a reductionistic viewpoint**
- ☺ **Know how biodiversity is created from a scientific perspective**
- ☺ **Know what humans share with all other living things**
- ☺ **Know the general things that all life/ecosystems require and limitations on organisms/ecosystems**
- ☺ **Know what cosmogeny myths and environmental ethics are**
- ☺ **Understand how the magnitude and type of effect people have on nature is closely allied with the diverse environmental ethics of the world's people**
- ☺ **Be familiar with the major effects some of our actions have had on nature and ourselves**
- ☺ **Know how service learning and the general material of this course enforces each of the five Marianist educational values**

Lab:

When a student completes this course they should:

- ☺ **Understand how to apply the scientific method**
- ☺ **Know the basic units used in making scientific measurements**
- ☺ **Be familiar with the practices used to ensure safety in research settings and proper waste disposal methods**
- ☺ **Know how to properly gather, store, manipulate and present scientific data**
- ☺ **Know how to conduct an assay for environmental pollutants**
- ☺ **Know how to calculate ecological footprint**
- ☺ **Know how to calculate important human population growth parameters: ARNPC, etc.**
- ☺ **Learn how to access and read the primary scientific literature**

☺ **Know how to prepare a formal laboratory write-up**

Grading:

You will receive a letter grade for both the lecture and the lab portions of this course. Lecture and lab exams will be as objective as possible although lecture exams will contain some essay/short answer questions which tend to be more subjective. For oral and written project assignments, laboratory worksheets and service learning you will be graded on your ***effort, correctness*** (when there is a correct response etc.) and your ***thoughtfulness***.

Effort in general manifests itself as participation, neatness, completeness, thoroughness, calories expended per unit time(!), timeliness, correct spelling, any extra creative things you do above-and-beyond what is expected, etc. Correctness means do your statements jive with corresponding scientific knowledge, do your conclusions follow from the evidence before you, did you calculate an equation correctly, interpret a graph accurately, make a table that illustrates your data properly, etc. Thoughtfulness can show up in many ways, perhaps you really think things through, trying to consider all the variables or you worked hard to tie pieces of evidence together, maybe you consider something that may be important that everyone else ignores. By being "thoughtful" I don't mean that you look out for other people (i.e. are kind) I mean that you have done some thinking, really reflected upon a topic, have given it some time, have analyzed it, etc. thoroughly.

All major assignments are already in the syllabus with the exception of the service learning activities and dates which are presented to you in a separate *Service Calendar*.

Your grades in lecture and lab will be based on the following:

Lecture Grade:

Exam I	20%
Exam II	20%
Final Exam	20%
Service Learning/Term Paper	20%
Worksheets & homework assignments	10% (20% if no pop quizzes)
Pop Quizzes on readings	10% (if given)

Lab Grade:

Lab Exam I	20%
Lab Exam II	20%
Lab notebook, worksheets & assignments	20%
Lab Write-Up	20%
Journal Article Presentation	10%
Attendance	10%

Some Course Specifics:

Service Learning Option:

In this course you will have the opportunity to work in the community and/or in the field and do a variety of activities that will teach you about nature and allow you to help ameliorate some of the effects people have had on nature that many people feel need to be reversed/rectified. These activities may involve teaching others about environmental issues, helping out at environmentally-related events, designing a research project or helping out "in the field" (as we biologists – which you now are -- like to say) as we try to restore native ecosystems, document the state of particular ecosystems, increase awareness, etc. These activities are all "Service Learning" opportunities. They are all enjoyable – experience has taught me this, my students always get a lot out of them, and they are all educational in a way that pertains to the course. **If you do five service outings (25 hours) then you**

do not have to do the term paper and you receive an automatic A for that 20% of your lecture grade.

Service learning activities occur in conjunction with one of a number of governmental environmental agencies, "NGO's" (non-governmental organizations) and individuals. The groups and people I use for service learning have been carefully chosen by myself because (1) I believe they have a worthy and justifiable environmental mission, and (2) they do things that provide opportunities for education for you. Some of these groups are: The Nature Conservancy, The US Fish & Wildlife Service and a High School Teacher in Waianae….

Term Paper Option:

The term paper is a 10 - 20 page, double-spaced, word-processed, paper about an issue relating people and nature. Your topic must be approved by Dr. Gail before you begin working on it. I will take a look at a draft of your paper if you like before you turn it in. Anyone caught plagiarizing ANY kind of source will receive an F in the course…and I am good at finding out if your work is original, so don't even try copying the thoughts of others…besides your own thoughts might very well be "golden!" The paper is due on **December 6** (the last day of class). It must have five hardcopy references and three of these must be original scientific research from a peer-reviewed scientific journal. (I will be teaching you how to find, read and interpret articles describing original scientific research as a part of this course.)

Extra Credit Options:

Periodically throughout the course there will be talks you may attend that pertain to the course material. I will let you know when these opportunities arise. If you choose to attend you will earn +1.5 extra credit points towards a lecture exam. If you do not wish to partake of the service learning option you may attend service outings and receive extra credit (+3 points per outing). If you do this you'll have to do the course term paper. If you do more than the five required service trips then you'll receive extra credit for those outings you do after your fifth (+3 per trip). You may not do the term paper as extra credit, if you do a term paper, it is for the grade (for that 20% of the course).

Attendance:

While I dearly hope that you can make every class…, since you are adults now, you are free to miss any *lecture* class you choose… but **KNOW** that there may be some consequences should you choose to exercise this option: your grade could (and most likely **WILL**) suffer. I believe that students who have missed a lot of classes ALWAYS would have done better if they had not missed classes. There simply is no substitute for being in class when it comes to understanding the material. Paddling analogy pertaining to this: don't bail water *into* your boat – come to class!

If you miss a lecture exam or lab your absence must be excused if it is not to *formally* effect your grade. Excused absences occur when you bring in a doctor's note, a funeral announcement for a family member, notice of participation in athletic events, plane ticket stub, etc. Unexcused absences occur when you were working, surfing, sleeping, cramming for an exam in another class, etc.

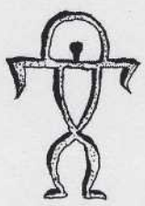
Classroom Atmosphere:

Guys, I value a very open, yet courteous class atmosphere. Express your ideas! Ask your questions! (The only dumb question is the one in which you ask yourself if you should ask your question.) Respect the thoughts and ideas and opinions of others – really think about what others say. Let them fully express their thoughts and ideas and then you do the same. **The thing I value most from my college days are all the wonderful, valuable, diverse ways of looking at and understanding the world that I was exposed to. Be an open vessel – take ideas in! You will learn as much from each other as you do from me.**

This syllabus and course schedule are living documents: they are free to change. I try to adhere as closely as possible to them for your convenience, but there will be times in which we will take longer on a particular topic or add or delete a topic to enhance the course. I like to be able to react to you as the course proceeds and go with the flow a bit in order to make the course experience sort of custom fit to you!

You are responsible for all of the information in this document: losing it or not reading it are NOT excuses for not knowing what's in it! USE IT to keep you organized!!!

Mahalo



People & Nature Questionnaire

This is a non-graded questionnaire which I give you so that I may assess where your interests are regarding the environment and your education at Chaminade, what you expect out of this course and a little bit about you and your background.

Name: _____

Where did you grow up? _____

Year at Chaminade: _____

When are you planning on graduating? _____

What is your major? (If you don't have one yet what are you thinking about majoring in?):

_____

Did you know Chaminade has a new Environmental Studies major? _____

Did you know Chaminade also has a minor and a Certificate in Environmental Studies? _____

Would you be interested in obtaining material about the Environmental Studies Program? _____

Would you like to be part of the new Environment Club at Chaminade? _____

Why did you take this class?

Are you interested in environmental issues? _____
Why or why not?

On a scale of 1 to 10 (10 being of utmost importance) how important do you think the environmental issues facing us today are? _____
What kinds of things are AS important as environmental issues in your opinion?

What kinds of things are MORE important than environmental problems in your opinion?

Do you have any experience with environmental volunteer work, education, etc.

Are you interested in a career in the environment? _____
If yes what specifically? (If you have an idea.)

What one environmental issue do you feel is the most important one facing the planet?

What science classes have you had in college or high school:

What are you hoping this course will teach you?

What are you hoping we will get to do in this course?

Finish this sentence: Good teachers . . .

Finish this sentence: Poor teachers . . .