

## Syllabus: CLEI/EART 81B Fundamentals of Environmental Science, Winter 2015

LEC #	DAY	DATE	TOPIC	READING	DUE
1	Mon	5-Jan	Course logistics, introduction	None	
2	Wed	7-Jan	Basic principles: temperature, pressure, energy	Oliver and Hidore Ch. 2	Country Sketch #1
3	Fri	9-Jan	Basic principles: Earth radiative balance	Archer Ch. 2	Problem Set 1
4	Mon	12-Jan	Greenhouse effect part 1	Oliver and Hidore Ch. 15	Country Sketch #2
5	Wed	14-Jan	Greenhouse effect part 2		Country Sketch #3
6	Fri	16-Jan	Climate change part 1	Global warming (Rolling Stone); Business and climate change (Slate)	Problem Set 2
	Mon	19-Jan	<b>University Holiday</b>		
7	Wed	21-Jan	Climate change part 2	Nitrogen shortage; Phosphorus shortage (Sci Am)	Country Sketch #4
8	Fri	23-Jan	Discuss Consumer's Guide to Effective Env Choices	Bower & Leon (book)	Problem Set 3
9	Mon	26-Jan	Water resources and water cycle part 1	Cunningham & Cunningham Ch. 17; Freshwater shortage (Sci Am)	Country Sketch #5
10	Wed	28-Jan	Water resources and water cycle part 2	Cunningham & Cunningham Ch. 18; Peak Water (World's Water)	Country Sketch #6
11	Fri	30-Jan	Intro to atmospheric chemistry	Graedel & Crutzen Ch. 7 and 8	Problem Set 4
12	Mon	2-Feb	Stratospheric ozone depletion; ozone holes	Sustainability (Erlich)	Country Sketch #7
13	Wed	4-Feb	Urban air pollution	Indoor air quality (Sci Am)	Country Sketch #8
14	Fri	6-Feb	<b>Review for Midterm</b>		Midterm
15	Mon	9-Feb	<b>Midterm</b>		
16	Wed	11-Feb	Ecology: Exponential & logistic growth, demography		
17	Fri	13-Feb	Population viability & modeling	Palumbi Ch2: Right before your eyes	Problem Set 5
	Mon	16-Feb	<b>University Holiday</b>		
18	Wed	18-Feb	Stochastic factors and extinction	Palumbi Ch3: The engine of evolution	
19	Fri	20-Feb	Evolution & genetics	Withgott and Brennan, Ch. 5	Problem Set 6
20	Mon	23-Feb	Genetic drift & Minimum viable population	Primack 1995, Ch. 3 (107-161)	Environmental Action #1 assignment due
21	Wed	25-Feb	Managing endangered species	W&B Ch. 16(457-464), Rosenberg et al 2006	
22	Fri	27-Feb	Sustainable harvest	VanDriesche Ch 3: The great mixers	Problem Set 7
23	Mon	2-Mar	Community ecology	VanDriesche Ch 6: Fading forests	
24	Wed	4-Mar	Impacts of invasive species	VanDriesche Ch 8: After all the sheep are gone	
25	Fri	6-Mar	Invasive species control and restoration		Problem Set 8
26	Mon	9-Mar	Biodiversity, landscape-scale conservation	Withgott and Brennan, Ch. 16(442-457,465-471)	Environmental Action #2 assignment due
27	Wed	11-Mar	Reserve design	Withgott and Brennan, Ch. 7, Sinclair 2009	
28	Fri	13-Mar	Ecosystem ecology, N deposition, ocean acidification	Guinotte et al. 2006	
29	Mon	16-Mar	Review for final exam		

**Instructors**

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**Teaching Assistants**

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**Course Information**

**Class Website through eCommons:** To access the course page, sign in to eCommons using your CruzID gold. The course page should automatically be available to you.

**Class Meeting Times:** MWF 9:30-10:40, PSB 114.

**Midterm Exam:** During class on Monday, February 9. The exam will not be offered at any other time.

**Final Exam:** Wednesday, March 18 from 12:00 to 3:00 PM. The exam will not be offered at any other time. The final exam will cover only the second half of the quarter.

**Discussion Sections:** All sections meet in Earth and Marine Sciences Room D236. The purpose of discussion sections is not to tell you how to do the problem sets, it is to help you learn the skills that you need to do the problem sets. Thus, the TAs will be doing problems that are DIFFERENT FROM but RELEVANT TO those on the problem sets.

**Section Policy:** Attendance in section each week is required. If you miss more than one section, you will lose 1% off your final grade for each missed section. Due to the size of the class, you must attend only the section that you are assigned to. With prior permission, you may attend a different section ONCE during the quarter in case of some unforeseen circumstances.

**Required Reading:** All the readings will be posted on eCommons as electronic articles. No need to purchase anything. Also required is *The Consumer's Guide to Effective Environmental Choices* by Brower and Leon. This can be purchased new (Bay Tree or elsewhere) or used online.

**Supplemental material:** Will be provided through the course website. Unless otherwise noted, handouts are to be considered part of the core material; you are responsible for information disseminated through eCommons.

**Missed Classes:** You are responsible for all material provided in class, including any instructions or changes to the syllabus. If you miss a class, you should get the notes from a fellow student.

**Academic Integrity:** We hold strictly to the university policy on academic misconduct (cheating and plagiarism), and we aggressively prosecute cheating cases. Our academic sanction for cheating is zero credit for the assignment or exam. You are encouraged to familiarize yourself with UCSC's academic integrity policy and process at [http://www1.ucsc.edu/academics/academic\\_integrity/undergraduate\\_students/](http://www1.ucsc.edu/academics/academic_integrity/undergraduate_students/)

## Evaluation

Homework: 8 problem sets x 4% each = 32 %

Country Sketch assignments: 18%

Exam #1 (Physical Environmental Science): 25%

Exam #2 (Biological Environmental Science): 25%

Missing more than one lab section will lead to a loss of 1% per section from the final grade (see above).

It is in everyone's interest to help each other do the best you possibly can, because grading will not necessarily be "on a curve." If we do curve the grades, they will be curved upwards, not downwards. If everyone were to demonstrate outstanding understanding of all the material, then everyone would deserve a grade of A (and we would be very happy to give each one of them)!

**Homework sets:** These will be comprised of questions on the reading and quantitative problems. They will be due on Friday IN CLASS: Unless by previous arrangement, late homeworks (worth 50%) will only be accepted in class on Monday. Homework sets will not be accepted after that. All homeworks must be stapled (if they're more than one sheet of paper long, obviously). If not, you will lose 10% off your grade for that homework.

**Extra credit: \*\* There will be no extra credit offered to any individuals. No exceptions. \*\***

If extra credit work is offered, it will be available to **all students** in the class. After the course is over, students who ask professors how they might improve their grade post-facto will be subjected to rude eye-rolling.

## Course Tenets

1. University is about learning skills. Learning facts to accompany these skills is also necessary, but not the most important part. To learn facts, you can go to the library and read a book. It would be easier and a lot cheaper. The reason university is harder and more expensive is because learning skills is much more challenging. However, learning a new skill also requires significant effort from the student, and this is your responsibility in this course – to make the most of this opportunity by investing the time, energy, and thought necessary to master something new.

2. Why are calculations part of the course? Simple arithmetic and algebra is a part of this course for a simple reason: this is a science course at the university level. Sciences are fundamentally quantitative, not descriptive. Therefore, fluency in the use and manipulation of numbers is fundamental to learning any science. In almost all cases, all you are really expected to do is add, subtract, multiply and divide. Occasionally you may have to take a square root. That's it, and everyone knows how to do this since you all graduated from high school. Some fraction of you may be overcome by the desire to claim that "I can't solve this problem because the math is too hard (or I'm terrible at math, I hate math, etc.)." In 99% of these cases, the problem isn't the math, it's a lack of comprehension of the concepts, i.e. you don't understand the concepts well enough to figure out if you should multiply the two numbers or divide them or subtract them. **This is exactly where the difficulty in a course should lie**, since the homeworks will help you understand key concepts at a deeper and more meaningful level. Once you grasp strongly the concepts, the math part (the multiplication, for example) turns out to be very simple.

## Problem Set Tenets

1. Work together! Many studies show that working in small groups is one of the best ways to learn. Note the verb "working", which connotes being **actively involved** in the process. Sitting around watching your friends work isn't the same thing!

Note: While working together on homeworks is strongly encouraged, **verbatim copying of one person's homework by another is NOT appropriate**. Thus, word answers **must be written in your own words** even if the conceptual idea is the same as somebody else's. We realize that for quantitative problems, working together may lead to identical solutions, but you should do your best to make sure each person is contributing and understands the solution. **Directly copying another person's homework without contribution is a serious offense and if we catch anyone doing it, we will give all parties involved (yes, including the person who actually did the homework) a zero**. This is considered a serious offense because it violates the basic contract between the student and the instructor and the university, i.e. that we provide you the opportunity and guidance to learn something new, and that you do your best to learn it. Copying other people's answers clearly does not involve any learning at all!

You might also notice that it is difficult to catch some copying while encouraging group work. However, students who don't do their own homework will be at a strong disadvantage on the midterm and final exams, where about one-third of the overall grade will involve solving quantitative problems. The time to learn the quantitative concepts is on the problem sets, not right before the final exam!

2. Think about the real world. Sometimes it's easy to get lost in the mechanics of the math, but you should always have in mind that you are solving a physical or biological problem. This is especially important when you solve a problem – make sure that this solution makes sense to you given what you know about the world around you. You can also use what you already know about the real world to help you. If your solution suggests that Mars is warmer than Earth, then you know you've got a mistake somewhere.

3. Significant figures and scientific notation: Thou shalt use 2 or 3 significant figures for all problems unless otherwise stated. Thou shalt also use scientific notation for any large ( $10^3$  or larger) or small (smaller than  $10^{-2}$ ) numbers. Repeated offenders will lose points off their homeworks.