

**BIOL 107 – Introduction to Environmental Studies**  
**Fall Semester, 2007**

***“There is nothing in which the birds differ more from man than the way in which they can build and yet leave a landscape as it was before.”***

Robert Lynd, *The Blue Lion and Other Essays*

***“When one tugs at a single thing in nature, he finds it attached to the rest of the world.”*** John Muir

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**Office hours:** Mondays: 9:00 – 10:00 a.m.  
Wednesdays: 9:00 – 10:00 a.m. and 1:00 – 2:00 p.m. Thursdays: 1:00 – 2:00 p.m.

*I can meet with you at other times, but please schedule these appointments with me ahead of time.*

**Class meeting times:**

Mondays, Wednesdays, & Fridays @ 11:30 a.m. – 12:20 p.m. Fridays  
(lab): 12:45 – 3:45 p.m. *(Please note that a separate lab syllabus will be distributed during the first lab session.)*

**Course online site:**

Blackboard           **Course ID**       **BIOL107.FA07**  
   **Access Code:**     **107**

**Course text/  
required books:**

Wright, R.T. (2008) Environmental Science, 10th ed.  
Pearson/Prentice Hall (New Jersey)

*Note: You will also have a number of other readings that will be placed on reserve and/or that you will find from print media and internet sources throughout the semester. There is a separate laboratory notebook required for lab which will be noted in the lab syllabus*

**Introductory comments:**

I realize that those of you who are enrolled in this class have a variety of academic interests and many of you are here simply to fulfill the LinC F4 requirement. Throughout the semester, we will focus on science, environmental issues and ecological principles, and the impact of humans and technology on the environment around us. Science and technology so greatly impact our lives that I strongly believe that everyone should have at least a basic understanding of key scientific principles, and more importantly, see their applications in the real world. Studies of the environment provide an excellent way to learn some science and to see how scientific information might be applied to address environmental challenges confronting us today.

Environmental issues are often controversial - usually because of conflicting values of those

involved in the decision-making processes for solving problems or that lead to policy related to the environment. My job will be to provide you with some scientific framework related to environmental topics and help you to explore the various perspectives surrounding key environmental problems. More specifically, we will consider risk, the concept of an environmental ethic, the role of the media in influencing public opinion, economic and social issues, politics, and public policy related to science and the environment.

We will examine the various components of the world in which we live: the biosphere, atmosphere, geosphere and hydrosphere; and we will discuss the natural cycles that interconnect these spheres. More than any other living organism, humans have the ability to impact the environment and disrupt these natural cycles through population growth, industry, policy decisions, and applications of technology which can sometimes have unforeseen consequences. *Individuals* can profoundly affect change through public sentiment and voting, and, in turn, impact public funding and policy decisions. Thus, you have the power to affect the level of funding and the direction of scientific research, the applications and regulation of technology, and the status of our environment. Because of this, every individual should be a responsible, informed active participant in the governing processes.

Some of the major environmental topics that I plan to cover in this course include:

- > Ecosystems and biodiversity; natural changes and alterations caused by human action
- > Renewable resources (water, soil, food, wild species) Conservation and restoration science and practices
- > Energy sources
- > Solid and hazardous waste; Pollution and the threats to the biosphere
- > Atmospheric phenomena (including global climate change)
- > Sustainability

Most of these are complex issues. After learning about the relevant scientific principles involved with each topic, we will review and evaluate examples of scientific data used by technical experts and policy makers to determine both the extent of the problems and degree of risk posed to humans and environmental quality. It will also be important to consider how economic and political factors, media coverage and public perception impact public policy related to these environmental themes.

I provide lecture outlines typically on a weekly basis to help keep us all organized. These outlines will be posted on the Blackboard site for the course and will highlight key topics covered in lecture and our discussions, list the assigned readings, and include suggested study problems and assignments. I expect each of you to complete these assigned readings and assignments, and be ready and willing to participate in class discussions. You should get in the habit of checking this site a couple times each week as I routinely post announcements, reminders, schedule changes, etc.

The F4 component of LinC includes a laboratory requirement. Laboratory exercises in this course will serve to further illustrate the concepts discussed in lecture and are designed to introduce you to the process of scientific inquiry and experimentation.

**Course objectives:** By the end of the semester, students should:

- Have an understanding both of some fundamental scientific concepts that underlie key environmental topics and of the environmental challenges facing us today;

- Have an appreciation for the complexity and value of ecosystems, biodiversity and the relationship between humans and their environment,
- Be familiar with the four main spheres of our world and the interconnections between them (via the natural chemical cycles);
- Realize the wide range of values, risk assessment, and social, economic, historical, and political factors that influence the development of public policy –especially as it pertains to environmental regulations, conservation, and stewardship;
- Understand the global nature of many environmental issues and appreciate the wide range of world views on the value and priority of the environment;
- Be able to assess scientific and other forms of data, along with other information found in the literature for validity and relevance to environmental issues being considered;
- Gain practical, hands-on experience with scientific approaches used to study the environment; and
- Gain further experience in critical thinking, oral and written communication skills, and using technology to access important information.

***Course policies, procedures, and expectations:***

**Academic integrity:** In my opinion, academic integrity is of utmost importance and cheating or plagiarism will not be tolerated. Please read the **Academic Honesty Policy** that is included in the student handbook *and* the policy that I will distribute in class. I have attached a cover sheet to my policy that each of you will sign indicating that you have read and understand the policy and implications of violating it. If you have any questions about plagiarism or other forms of academic dishonesty, please ask. Several assignments in this class will involve the use of internet resources, and it is my experience that students often do not realize that copyright violations and plagiarism policies still apply

**Attendance policy:** As noted in the student handbook, students are expected to attend classes regularly. Due to emphasis on discussions in this course, regular attendance from each of you is essential. Frequent unexcused absences will have a negative impact on your grade for the course. I will recognize legitimate excused absences such as when students are representing the university in an official capacity such as for intercollegiate athletic competition (but not practice), off campus music performances, etc. Such activities are scheduled ahead of time, thus, I expect you to make arrangements with me ahead of time as well. In the event of an extended absence due to illness or other legitimate reasons please notify me and a representative in the Learning Services Center as soon as possible. In the case of severe illness, accidents, etc, we will work out arrangements (e.g. for making up work, obtaining an incomplete or withdrawing from the course) on a case by-case basis.

Please note that during the class periods, I will intersperse lectures, whole class and small group discussions and assignments, hands-on activities, and problem solving. The topics discussed in class can not be learned simply by reading the text without coming to class and being an active participant. I am fond of spontaneous in-class assignments that are turned in before the end of the class period, and these can not be made up if you are absent. In other words, if you miss class, you miss out. Students who arrive late to class disrupt the flow of the session and distract their peers. Please be prompt!

**Assignments:** I utilize a variety of types of assignments including group projects (in and out of class), short writing assignments, journals, internet-based assignments, etc. Timely completion of the work is expected; late submissions will not be accepted (i.e. not graded).

**Journaling:** It is always a good idea to be aware of stories in the media that relate to scientific

and environmental topics. This will be an essential activity in this course. The internet can be a valuable resource as well, but you have to critically evaluate the content and source of the information that you find there. Often, timely stories break in the news that warrant out consideration in class, and your familiarity with media coverage of science and environmental issues can (and will) provide the basis for class

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discussions. Active participation in these discussions will be noted and will have a positive effect on your final grade for the course. For certain class assignments, I will also ask you to find an article or internet site on a specific topic. *To this end, I would like each of you to keep a journal throughout the semester.*

I like students to determine the specific format and style of their journals. What I do require is that you date your entries and include the source of your information (e.g. which newspaper and what date, what magazine, edition and page number, the URL of a website, etc.). Keeping a regular record of stories that catch your attention or that relate to topics we are discussing in class, will allow you to reflect on what you are learning and how it applies to the “real world”, and allows you to follow trends throughout the semester. I expect that you should have at least 2 entries (news items) per week. Besides including the reference that you find, please include your personal reaction to the article and/or comments connecting the article to themes we are discussing in class. The journal can also be a place to react to course topics and activities. *On Fridays, we will begin class with a discussion of timely news stories related to the environment and other topics being discussed in class.* Prior to your submission of the completed journal at the end of the semester, I will ask you to summarize what you have learned from keeping such a journal and what trends or major issues you noticed.

Exams: Exams will cover material from lectures, class discussions, and the assigned readings and sample problems from the text or other assignments. A review sheet will be distributed approximately one week prior to each exam. You should expect at least a portion of these exams to be essay format. No make-up exams will be administered without an official medical or university excuse.

| <u>Grading</u>  | <u>% of Total Grade</u> |
|---|-------------------------|
| Assignments including participation in class discussions and activities               | 20                      |
| Exam #1 ( <i>Friday, September 28th</i> )   | 15                      |
| Exam #2 ( <i>Friday, November 2</i> )   | 15                      |
| Final Exam ( <i>to be scheduled during the exam Period: Deceniber12—15, 17—19,</i> )  | 15                      |
| Journal and summary ( <i>Due Wednesday, December 511? at the beginning of class</i> ) | 10                      |
| Laboratory component of the course  | 25                      |

I do look at trends in grades over the semester; improvement in test grades over the duration of the course will be favorably noticed! Participation in class discussions, review periods, etc. is expected and will be a factor in the determination of final grades. Please note that it is within the instructor’s purview to apply qualitative judgment in determining grades for an assignment or for a course.

**Optional Extra Credit Project:** I routinely get asked if there is any possibility of an extra credit project. Occasionally, we will hear about seminar opportunities or other special events on topics relevant to this course. Attending these and writing short reaction pieces is one way that you can earn extra credit.

In addition, I have decided to provide the following option to students

Read the book related to the environment. A few *examples* are provided below. If you chose a

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different book, please run your choice by me ahead of time. There are many contemporary and classic books to choose from.

An Inconvenient Truth –Al Gore

Silent Spring –Rachel Carson

A Sand County Almanac –Aldo Leopold

State of Fear— Michael Crichton

Enough –Bill McKibben

When the Rivers Run Dry –Fred Pearce

After reading the book, summarize what you learned from the book and what you thought of it (a book review, of sorts). In addition, consider how the book related to this course.

This will be due at the end of the semester (December ,rd)

**Lab syllabus on next page.**



**Of key importance in the lab:**

1. Safety;
2. An understanding of the principles underlying the experiments and other activities;
3. Attendance and participation;
4. Asking questions; and
5. Good record keeping and observation skills!

***Lab Safety Policies:***

1. Safety is one of the topics for the first laboratory session, but can never be over-emphasized. Never underestimate the potential for an accident to occur or the possible dangers that chemicals or certain laboratory activities pose to human health and safety.
2. Know the proper procedures to follow directions for the safe handling of all chemicals. I will review these at the beginning of any lab session in which we work directly with chemical reagents.
3. Goggles are a must for some of the experiments that we will do. (*Goggles are to protect your eyes – so don't do any good if they are not worn or worn around your neck!*)
4. No one will be permitted in the laboratory if they are wearing shorts, midriff tops, or sandals.
5. No food or drink is permitted in the laboratory. Of course, smoking is out as well!
6. Note that the laboratory contains many safety features; be sure to know the location of the eye wash stations, safety shower, fire extinguishers, first aid kit and nearest telephone – just in case!
7. Never perform unauthorized experiments.
8. Handle glassware carefully.
9. Safe practices will be reviewed throughout the semester. It is expected that each student will take safety seriously and practice good laboratory techniques.

***Other Laboratory Policies: (The important “list of rules”)***

1. It is important to keep the lab clean and organized. At the end of each laboratory, you are responsible for making sure that all materials and equipment are returned to the correct location and that the lab has been left clean for the next class.
2. It is expected that you read the laboratory materials (e.g. lab separates) **BEFORE** coming to lab each week. I will typically distribute these either in lecture or via the Blackboard site for the course. I will often assign some sort of pre-lab exercise to be completed prior to coming to lab and that must be submitted within the first five minutes of the laboratory period. Assignments from the previous week will also be due at the beginning of the class. **LATE WORK WILL NOT BE ACCEPTED.**
3. All students will enter data, observations, etc. in laboratory notebooks. All the data collected in the laboratory must be **entered directly in ink**. I will initial each student's entries each week upon completion of the work. Each student is expected and required to work individually when writing and recording in their notebook, even though data may be collected cooperatively with a partner during the experiment.

4. Science laboratory courses are meant to both give you hands-on experience in relevant laboratory procedures and techniques and to reinforce concepts from lecture courses. Science is about learning and *doing* – so it is expected that every student actively participate in the laboratory course.
5. Academic integrity is of utmost importance and cheating will not be tolerated. You have already read and signed the Academic Integrity Policy that I distributed in lecture. This policy applies to the laboratory portion of the course as well. **Note:** Even when you work on an experiment in groups, each student is expected to write up their own post-lab work. It is perfectly acceptable to discuss the data and assignment with others in the group or larger class, but I ask that you then work independently on the actual write-up of the report or whatever type of assignment I give.
6. **ALTERATION OF EXPERIMENTAL DATA WILL ABSOLUTELY NOT BE TOLERATED.** The elimination of any data from a table or graph must be noted and fully justified. The discussion of the data and the explanation of data that does not correlate with the expected results is more important than having the "right answer".
7. Missed Labs: Lab periods should not be missed except under extreme circumstances and it will be almost impossible to make up lab sessions.
8. Most experiments will be performed in small groups. Participation and cooperation by each group member is essential to complete the experiments on time. Division of labor is often a good idea. Group members must be able to work together and communicate with each other. You may meet with others in the group or with other class members to discuss the experiment and interpret the results, but your assignments and lab reports must be individually prepared. It is your responsibility to obtain all of the necessary data and enter it into your notebook before leaving the lab for the day.
9. Please do not remove any items from the laboratory.
10. Please don't use cell phones during the lab period!

***Laboratory Assignments and Grading:***

I will provide specific details regarding my expectations during the first lab session and throughout the semester. For instance, feedback from graded reports and assignments should be utilized to make corrections, modifications and improvements on subsequent work submitted.

As noted above, data, observations, etc. are entered directly into laboratory notebooks in ink. For some experiments, a formal laboratory report may be required. Alternatively, there may be a quiz or problem set or some other form of assignment to complete. Details will be provided during the weekly pre-lab lecture. Laboratory technique (including safety and clean-up) and participation in the class discussions are also a part of the grade for each laboratory exercise.

Incompletes will be NOT be given, except for extreme circumstances beyond the student's control. The final decision is up the instructor.



Grading:

**% of lab grade** (remember that this counts for 1/4 of your total grade for the entire course)

**Laboratory technique and participation** 40%  
(including your laboratory notebook)

**Assignments, quizzes, pre-lab exercises, lab reports** 60%

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**WRITTEN LABORATORY REPORTS**

A written formal laboratory report, if assigned for a particular experiment, will be due one week following the completion of an experiment. **LATE LAB REPORTS WILL NOT BE ACCEPTED.**

All reports must be typed using proper grammar, complete sentences and paragraphs. Tables and graphs must be in ink also. Do not use pages from your laboratory notebook for your reports. Reports will be evaluated for their accuracy, completeness, format and quality (including neatness and professional looking graphs and tables). Reports that are written incorrectly or that are incomplete will be returned ungraded. In these cases, you will usually have the opportunity to redo the report after discussing the problems with me.

Manuscripts in scientific journals (not review articles) provide examples of format and content. I highly suggest that you browse through some journals in the library to see what scientific reports are like. Specific guidelines will be given for individual reports, but a general format for your reports follows.

Do not wait until the last minute to write up a lab report. It is easier to start when the procedure and data are still fresh in your memory. That way, if you have questions, you will also have more time to ask me questions. I may not be available to deal with problems of those who wait until the last minute to do their lab reports.

**GENERAL LABORATORY REPORT FORMAT**

**Title Page**

- Include experimental title, date, lab section, and name(s) of experimenter(s).

**Introduction**

- The introduction should be a brief explanation of the experimental objectives and the general approach used to address the scientific question. Some theory underlying the experiment should also be included.

## Methods

- The details of the methods should be described in complete sentences (not a list of tasks performed) only as they differ from the methods listed in the text, handout or other reference used. The source of the complete procedure should be formally referenced in the bibliography at the end of the report.
- The methods section, as well as others, are written in the past tense (what was done). Also avoid "first person" usage ("I treated the samples with..."); rather, write using a passive voice ("The samples were treated with.....").

## Results

### Data:

- Tables and graphs of the raw data collected are included in the Results section of a report. The textbook includes instructions on preparing graphs and tables; there are also some examples included in this syllabus. Typically raw data is used to construct preliminary tables and graphs that would not be included in a formal publication, but I would like these included in your reports so that it is easier for me to find errors should they exist.

- Tables and figures should contain legends, should be neat and in ink, and should be titled, numbered, and clearly labeled (including units). Someone unfamiliar with the data and experiment should be able to remove a figure or table from a report and be able to determine the meaning and significance of the information within it without having to refer to the text of the report.

### Calculations:

- Always show a sample calculation for all mathematical data manipulations so that I can check them for accuracy.

### Text:

- Sometimes short explanations or descriptions of the data are included in the Results section, but analysis or interpretation of the data is not included here.

## Discussion

- This section is a summary and explanation of the results in terms of the principles to be learned. Relate the results back to the objective(s) stated in the Introduction. You should explain how the data demonstrates what was predicted or why the data deviates from the expected or literature values. "Experimental error" is not a specific enough explanation, but one that I commonly encounter when grading.

- Any questions asked in the lab handouts should be addressed in the Discussion section of the report.

## References

- All reports should include a list of citations used for the methods, literature values, and theory or analysis included.