

Biology 141 General Biology

Robert Waldeck

This course is for science majors-usually biology, biochemistry, neuroscience and non-declared majors, first semester, freshmen year,
All work was assigned and delivered via Blackboard and no printing was needed (although it is assumed items will probably be printed out by students)

Looking at the syllabus you will find this project under the heading “Group Learning Project”. I “infused” sustainability into the overall course format, which includes basic biology and chemistry on subjects such as, protein structure and function, cell organization, energy usage and metabolism, cell division, principles of genetics, gene expression, and evolution. It is a full semester so I have to be careful to fit the sustainability material in as well as possible and still cover all other necessary material for the students to be prepared for the second semester course. In the past few years I have included a group theme project on major issues in science where students look at the scientific, political, and ethical issues surrounding the topic. This year I let sustainability be the main topic for all. Below I have included what I added to my syllabus for the course in terms of the sustainability.

Learning Objectives:

- Be able to describe sustainability.
- Be able to describe some of the issues facing our world and our country in terms of this issue.
- Understand the importance of biological/chemical substrates (water, oxygen, carbon dioxide) and how they fit into the overall picture of sustainability .
- Describe how sustainability fits into the University’s life and you as part of the community?
- Determine what is the University of Scranton’s status on this issue?
- Describe your influence on this status?

Assessment

- Group class presentations and class discussion on description of sustainability and on specific problem areas, the importance of the water molecule, and key issues facing the planet.
- Group discussion of the University’s impact on sustainability and the involvement of students
- Written report on the University’s impact on sustainability and how students, faculty/staff, business, and the region fit in.

Plan of Action

First Day of Class: Students will work in groups of 4-5 students (dependent on class size) I will give brief introduction to the topic purposely so as to not bias their first responses.

First project: What do students think about sustainability?

Groups meet and then I will survey students on what they think the issues are and what the University is doing about this and how would they describe their role? First assignment is to look at their 24 hour day and see how they affect sustainability. No background material given. Report back to class in one week to class.

Second project: Now what do students think about sustainability?

Discuss findings of their personal surveys in the group and group report to the class. Now assign some of the web sites that define sustainability (used in our Sustainability Workshop background readings) and have them re-assess their 24 hour audit of themselves. Report back to class.

Will plant seed that students need to look at themselves and University to understand sustainability at the local level. Describe briefly that we will read several articles on global issues. This information may be used in their final reports so they should view the student presenters as resources for their reports. At the end of semester, students will report on the University's impact on sustainability.

Third project: Characteristics of Water and its Importance to Sustainability

Assign specific articles to certain groups on water from a 2005 special on "The Water of Life" from Scientific American. Each of these groups will have different articles to report back to the class. Include topics on molecular structure and characteristics of the water molecule, safeguarding water, wetland importance, irrigation, and glacial melting. Report back to class

Fourth Project: Interactivity of ecosystem-example of photosynthesis.

I will lecture on biochemical issues and processes of photosynthesis. Assign topics to different groups on how we are influencing the balance of this important process-from increase in CO₂ leading to more poison ivy and bugs to ozone layer being affected and leading to increased radiation, etc

Fifth Project: Key Issues of Maintaining Planet Earth

Will assign different groups an article from the Scientific American edition "Crossroads for Planet Earth" (vol 293) and will cover human population, poverty, energy, water, public health.

Sixth Project: What is the University's Impact on the Planet?

I will give them PDFs and web sites (some that Mike shared with us before the workshop, like the Global footprint) to give them some ideas on determining an answer to this question and we will discuss this. As we near the end of the semester, they will be assigned to play the role of either the University, the City, or the Students and determine their impact on the sustainability of the region. They will report back to the class in a final project discussion and paper. Part of their task will be to look into the mission of the University and what impact will the new campus center or new science building have on be sustainability?

Final Assignment was assigned and students uploaded it to Blackboard at the end of the semester.

Some of the PDFs available on Blackboard for students to download,

<http://www.bio.psu.edu/greendestiny/publications.shtml>

The Tragedy of the Commons by Garrett Hardin, 1968

"Higher Education: Good for the Planet?" 2000. Bulletin of the Ecological Society of America. 81: 152-156. This paper describes the ecological crisis now confronting humankind and challenges universities to become part of the solution (not part of the problem).

"The Penn State Indicators Report." 2000. This report gauges sustainability, or lack thereof, at Penn State using 33 sustainability indicators.

"Green Destiny: Universities Leading the Way to a Sustainable Future." 2001. BioScience 51: 36-42. This paper places Green Destiny's sustainability initiatives at Penn State in a national context.

"Penn State's Emerging Ecological Mission." 2001. Green Destiny Council. This document lays out a comprehensive ecological mission for Penn State.

"Mueller Policy Payer #5: Highlight Penn State's Environmental Stewardship Record on the Web", 2003. In an age when many students spend more time socializing on the net through email and instant messaging than engaging in face-to-face dialogue, it is surprising that typing "recycling" into the Penn State Search Engine provides a list of hits but none take you to the information on how or what is recycled at University Park.

"Awaken: A Penn State Orientation Guide" 2003. This guide is a rallying cry for us, as students, to take control of our four years here. Hence, it is an invitation to explore the "big questions": Where are we in space, time, and history? How are we affecting this earth we call home? What are some things that we wish someone had told us when we were freshmen, so that we could maximize our time here? What are some challenges to the mind, body, and spirit that we will face here? What's the point of coming to college, anyway? How can we use this guide to help each other take ownership of our lives, our education, and the world that we live in?

"Getting It Done: Effective Sustainable Policy Implementation at the University Level." 2003. Planning for Higher Education.. 31(3): 53-61. Joshua M. Pearce and Christopher F. Uhl. A four-step process that has awakened

The Pennsylvania State University to its ecological impact and is moving it toward sustainable resource-use policies is presented as a general model for ecological reform in universities. The first step was to frame the problem by conducting a high-profile ecological assessment of the institution using sustainability indicators. This created both the justification and the momentum necessary to persuade the university to adopt an ecological mission (step 2). Next, a detailed ecological and economic analysis of a university facility was made (step 3) to establish concrete socio-techno solutions that could then be extrapolated (step 4) to form specific sustainable policies for the entire university.

**BIOLOGY 141 – GENERAL BIOLOGY SYLLABUS
FALL 2006
University of Scranton
Tuesday & Thursday 2:30 – 3:45 PM Hyland 206**

Instructor: Dr. Robert Waldeck
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Email: waldechr2@uofs.edu
Phone: 570-941-4324
Office Hours: Tues 10-11 AM, Fri 9-10 AM or 2-3 PM or by Appointment

Course Text

- Campbell, N.A. and Reece, J.B.. Biology 7th edition Benjamin/Cummings Publishing company, Inc. 2005
- Electronic Reserved Articles: see Blackboard for list and downloading.

Course Objectives:

This course is the beginning of a comprehensive study of the nature of living organisms, plant and animal, their structure, function, development and relationships. Learning these concepts and related fundamental principles of biology will orient your thinking in a way that prepares you for more advance study in biology. Memorization of facts and definitions will be needed, however you must be able to use this information to extrapolate to novel situations.

This biology course is structured to serve the needs of the student planning to major in the natural sciences and health related fields. In addition one of the goals of this course is to illuminate the various career paths available to students with a background in

biology and the relevance of biology to global issues facing all of us. For this, we will focus on sustainability as an example.

Following this course the student should have knowledge of terminology, classifications, methods and trends in the biological sciences as well as a grasp of the fundamental principles and theories underlying biology. The scientific process of how this knowledge was gained and formulated should be clear.

Group Learning Project

In addition to the regular text work we will supplement this with outside reading (on External Link site on BlackBoard) and an assessment of the University of Scranton's impact on sustainability.

Project Objectives:

- Be able to describe sustainability.
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Project Assessment

- Group class presentations and class discussion on description of sustainability and on specific problem areas, the importance of the water molecule, and key issues facing the planet.
- Group discussion of the University's impact on sustainability and the involvement of students
- Written report on the University community's impact on sustainability.

Course Grading Policy:

Lecture Exams: (3) =	56% (all three 1 st =16%, 2 nd & 3 rd =20% ea.)
Final Exam	24%
Group Project	10%
Participation/ Class Attend	5 %
Quizzes/Homework	5 %

Grading Scale for Final Overall Grade:

(A) 100-95, (A-) 94-90, B+ (89-87), B (86-83), B- (82-80), C+ (79-76), C (75-73), C- (72-70), D+ (69-66), D (65-60), F 59 or less.

- The lecture and final exam will be in multiple choice, matching, fill-in, and short essay format..
- Exercises will include writing in class on text readings, as well as a writing assignment on a specific topic and a group learning project.

- Quizzes and homework assignments will be given to give you a sense of the material to expect on exams and for you to assess your level of knowledge before the exams.
- If an exam is missed and you have an official excuse, the grade for that exam will not be counted in calculating the final grade. If you miss an exam and do not give an official excuse you will receive a “0” for that exam and this grade will be calculated into your final grade.

Use of Blackboard

- Blackboard, which is a web site for our class activities, will be used throughout the course and each student is responsible to check our class site daily. You will find the syllabus, Learning Objectives for each chapter, files with the figures to be used in class, and other material you need.
- Also note when I email students it will be to their University email address. You must check this for messages even if you have your own personal accounts elsewhere.
- Information: if you are having problems with access contact Information Resources (IR) at:
- <http://matrix.scranton.edu/informationresources/irpolicies.asp>
- For questions regarding Blackboard:

<http://ATCprod.scranton.edu:8080/>

Phone: (570) 941-HELP

Logging in to Blackboard

1. Go to <http://www.scranton.edu/bb> (opens in new window).
2. Click on the Login button.
3. Enter your Username - the first part of your email address (prior to the @scranton.edu).
4. Enter your Password (default: Social Security number or Royal ID plus two-digit day of birth).

Note: Don't forget to change your password once you've successfully logged into Blackboard.

Tips for Succeeding in Class

1. Take good notes!! Checking the **Blackboard course site** for note outlines and figures to be discussed in class before class and reading the text before class will aid in this..
2. Attend class on time. Exam material will be mostly from class work so it is to your advantage to be there.
3. ASK QUESTIONS. If you still have questions, please see me before the week of the exam.
4. Keep up with the text reading so that the material is familiar sounding to you.
5. Participation is greatly welcomed, however talking amongst students is not, it interferes with your and fellow students' learning and it is rude! It can count against you in your Participation grade.
6. Ask questions- in class and in your dorm.
7. Please see me if you have questions!

Academic code of honesty:

I expect you to be familiar and follow the University policy. See:

[HTTP://ACADEMIC.UOFS.EDU/ORGANIZATION/USENATE/CODEOFHONOR.HT
M.](http://academic.uofs.edu/organization/usenate/codeofhonor.htm)

Lecture Schedule & Reading Assignments*

Date	Topic	Text Assignment
August 28	Intro/Science/Organization of Life	1 Group Project 1
30	Chemistry of Life	2, 3, 4 Reading #2
September 5	Evolution and natural selection: theory and evidence	22
7	Natural selection Early earth and origin of life	22 26 Discuss Reserve articles
12	Macromolecules	5 Group Project 2
14	Quiz 1 Cellular Organization	(1-5,22,26) 6
19	Cellular Organization	6
21	Protein & cell organization review	Group Project 3a
26	EXAM 1	(1-6, 22,26)
28	Membranes	7
October 3	Metabolism	8
5	Cellular Respiration	9
10	Quiz 2 Cellular Respiration	(7,8) 9
12	Photosynthesis	10 Group Project 3b
17	FALL BREAK	
19	Photosynthesis	10
24	Exam 2	7-10
26	Cell Communication Cell Cycle	11 (p. 203-205) 12

31	Cell Cycle	12
November 2	Meiosis	13
7	Mendelian Genetics	14
9		Homework Due

14	Chromosomal Basis of Inheritance	15 <i>Group Project 3c</i>
16	Exam 3	(11-15)
21	Molecular Basis of Inheritance	16
23	Thanksgiving Break	Gobble Gobble
28	Gene to Protein	17
30	Genetics: Prokaryotes	18 (p. 353-356) <i>Group Project 4a</i>
5	Eukaryotic Genomes	19 Homework due <i>Group Project 4b</i>
7		<i>Group Project 4c</i>
Final Week	Final Exam to be assigned.	

*Schedule may change throughout the year.