Biology 120 Concepts in Biology
Fall Semester 2001

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Office Hours: MWF: 11:30 - noon, TTh: 10-10:30 *and* by appointment

Lecture Hours: Tuesday, Thursday 11:30 a.m.-12:45 p.m. **Room**: Pierce 102
Lab Hours: Mondays 2:00 p.m.-5:00 p.m. **Room**: Pierce 125

Required Text: (available at bookstore)
Biology: Concepts and Applications, 4th ed. Starr, Cecie. Wadsworth Publishing Company. 2000.

Required Labtext: (available from Biology Department)
Laboratory Manual for Concepts in Biology, 3rd ed. Morgan, Judith Giles. Emory University Press, 1998.

Course Plan:

1. The objective of this class is to explore the core concepts of energy flow through biological systems by examining the biology of food, metabolism, and ecological relationships. Each day we will start with an observation about food and ask a question about that observation. We will then explore various hypotheses intended to answer that question. I can certainly lecture the whole class, but I prefer if the class is student-driven. Therefore it will be up to you to participate, if not lead the discussion. There will be times when you do run the class in the form of a presentation of your research. There is no prerequisite for this course.

2. This course has been approved as a writing intensive course. Therefore to satisfy the writing requirement, almost every week you will be turning in a writing assignment. You will be given general instruction in science writing and specific instructions for each writing assignment. You will be required to meet with me to go over your first research paper draft. You will get feedback on all research paper drafts and will have the opportunity to revise some of your writing assignments. Information about specific writing assignments is given below and details about each writing assignment will be discussed in class two weeks before the assignment is due.

3. Attendance at all lectures and labs is required. The Biology Department Absence Policy is reproduced at the end of this syllabus. Your success in learning the material is dependent on attending class, taking good notes, and participating in discussion. Open discussions that are

informative and thought provoking will happen only if you come to class prepared. All lectures are structured to encourage time for questions and discussion.

4. You are encouraged to form study groups and to work with your peers. However all work turned in for credit is to be of your own thoughts and construction. You must work to understand the ideas, not just memorize the material. You are encouraged to come to my office for additional discussion.

5. In the lab, we will be working with potentially infectious microbes and dangerous materials. There will be dissections of sharks, pigs, fish, earthworms, and flowers. **Food and drinks are absolutely prohibited!** It is imperative that you read the lab before attempting the experiment.

6. We have a Learnlink Class Conference entitled "120 Ostrow" in the Oxford College/Class Conferences/Biology folder. Place the icon on your desktop and check the conference daily for announcements. Feel free to post messages related to the class.

7. Any student with a permanent or temporary disability is encouraged to contact the Office of Disability Services which offers and coordinates support services to ensure each person has an equal opportunity to participate in the Oxford College community.

8. Cheating is not acceptable. You must abide by the Honor Code. Your signature on items turned in for credit (examinations, research papers, homework, lab work) attests to your upholding the Honor Code.

9. No cell phones, pagers, or other noisome devices are allowed in class.

10. I do not provide back-tests for this class. If you know of any back-tests for this class, please let me know and then I will make them available for the whole class.

11. Late material is accepted but I deduct 10% per day late.

12. Grading Your grade in the course will be based on a point system with an approximate total of 550 points. The final points for each item may vary.

3 midterm tests	34%	150 points
1 final exam	15%	85 points
3 lab tests	24%	135 points
7 lab reports	7%	35 points
1 resources exercise	1%	5 points
3 research papers	25%	140 points
Total	100%	550 points

The scale is: 90-100% = A

80-89% = B
70-79% = C
60-69% = D
<60% = F Plus and minus grades are given.

Tests

There will be three midterm tests and a final exam. Lecture tests will include multiple choice questions, short written answers and longer written essays. The Final exam will have a comprehensive essay. Lab tests have both a written part and a practical component. Tests will be taken at the scheduled time. If you are too sick to take a test **you must let me know prior to the test**; otherwise you will receive a 0 for that test**!**

Writing Assignments

Lab reports (7 @ 5 points each = 35 points)

There will be lab reports associated with eight of the 11 labs. Each report will be about one page in length and will pertain to data collected during the lab exercises. Reports will vary from answering discussion questions posed during lab, to drawing graphs and interpreting the data, to drawing organisms and describing behaviors. The specific reports will be assigned in lab and usually will be due by the Thursday of the week. I will drop the lowest report grade.

1 Library Resources Exercise (1 page) 5 points

The objective of this exercise is to get you used to finding research materials online and obtaining them in the library. You will use the handout provided in class to search various databases for a specific subject. The completed exercise is due in class Sept. 4.

3 Research papers

All research papers will be typed, double-spaced, 12 point font, and due on the days listed in the schedule below. You must properly reference all citations (author, title of article, source, date, volume and page numbers, and publisher).

A. Nutrient paper (2 pages minimum) 20 points

Organisms need food for energy and nutrients. You will choose a specific nutrient (e.g. calcium, niacin) to investigate. For your chosen nutrient, use the following guide questions as you research it: What is its chemical structure? Does it have another name? What are sources of it? Can it be made synthetically? Why do organisms need it? How much is needed per day? What are the effects of getting too little/too much? How does it taste? (Not all questions are pertinent to every component!). We will discuss your research in class during the Nutrient Forum on September 20.

B. Food acquisition strategy paper (4 pages minimum) 40 points

Organisms use various strategies to locate, capture and ingest their food. You will choose a specific acquisition strategy (e.g. web entanglement, echolocation) to investigate. For

your chosen acquisition strategy, use the following guide questions as you research it: What organisms practice this strategy? How do practice/accomplish this strategy? What sort of food can be captured using this strategy? How efficient is this strategy? What are the benefits/risks/limitations to the strategy? We will discuss your research in class during the acquisition strategy Forum on October 9 and 11.

C. Global Hunger (8 pages minimum) 80 points

It is estimated that there will be 10 billion humans on this planet by the year 2050. You will research a specific method to increase the world food supply and/or reduce hunger (e.g. improving traditional farming techniques, improving food transport). You should investigate: the current methodology, new technology, economics, environmental impact, advantages, disadvantages, and limitations for your method. We will discuss your research in class during the Global Hunger Forum on December 4 and 6.

Class Participation

The final grade you receive can be influenced by your attendance and class participation.

Lecture Schedule

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Week	Date	Topic	Reading	Writing due
1	8/30	Introductions, Resources		
2	9/4	What is science? What is life?	Ch. 1; pp. 468-9	Lib. Resources
	9/6	The Chemistry of Food: What is Food?	Ch. 3	Nutrient refs.
3	9/11	The cellular machine	Ch. 4, p. 88	Nutrient draft
	9/13	The struggle for food: dynamic interactions	Ch. 39, 40	®
4	9/18	Ecology of Food: Who eats who?	Ch. 41	
	9/20	Nutrient Forum	pp. 610-615	Nutrient paper, ®
5	9/25	**TEST I**		
	9/27	Nutritional modes: Photosynthesis & respiration	Ch. 6, 7	Acqui. refs., ®
6	10/2 & 4	Digestive Physiology	Ch. 36, p. 503	Acquis. draft
7	10/9 & 11	Acquisition Strategies Forum		Acquisition paper
8	10/16	No Class (Fall Break)		
	10/18	Microbiology of food	Ch. 20	
9	10/23	Food-borne diseases	Ch. 20	
	10/25	Food Safety/ Bacteria lab results	Handout	
10	10/30	**TEST II**		®
	11/1	Genetics of Food	Ch. 13	®
11	11/6	Genetics of Food II	Ch. 13, 14	
	11/8	Genetically Modified Organisms	Ch. 15	Hunger refs.
12	11/13	What's for dinner? Fungi and Plants	Ch. 21, 22	
	11/15	What's for dinner? Animal Diversity	Ch. 23, 24	Hunger draft, ®
13	11/20	**TEST III**		
	11/22	No Class (Thanksgiving Break)		

Week	Date	Topic	Reading	Writing
14	11/27	The struggle for food: Malthus and evolution	Ch. 16	Hunger draft II
	11/29	Evidence for evolution	Ch. 18	®
15	12/4, 6	Global Hunger Forum		Global Hunger paper
16	12/11	The Future of Food / Review for Final	Ch. 43	®
	Fri.	Dec. 15 **Final Exam 9:00 a.m. -12:00 noon**		

® = Lab report due

Lab Schedule

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Mondays 2-5pm

Week	Date	Topic	Lab Report?	
2	Sept. 3	No Lab (Labor Day Holiday)		
3	Sept. 10	Scientific Investigation (Exercise 1) (bring table scraps)	®	
4	Sept. 17	The Microscope; The Cell (Exercise 2)	®	
5	Sept. 24	Aquatic Ecology (Exercise 13) (we will jump in a lake)	®	
6	Oct. 1	**LAB EXAM I** (first hour) (Ex. 1, 2, 13) Photosynthesis (Exercise 3) (2^{nd} and 3^{rd} hour)		
7	Oct. 8	The Digestive System (Exercise 10)		
8	Oct. 15	No Lab (Fall Break)		
9	Oct. 22	Monera, Protista, and Fungi (Exercise 7)		®
10	Oct. 29	Foraging Strategies (Exercise 12)		®
11	Nov. 5	**LAB EXAM II** (Ex. 3, 7, 10, 12)		
12	Nov. 12	Molecular Biology (Exercise 6)	®	
13	Nov. 19	Plant Diversity and Anatomy (Exercise 8)		
14	Nov. 26	Field trip to DeKalb Farmer's Market (bring $)	®	
15	Dec. 3	Animal Diversity (Exercise 9)		®
16	Dec. 10	**LAB EXAM III** (Ex. 6, 8, 9)		

Lab Reports

Week	Date	Topic	Lab Report
3	Sept. 10	Scientific Investigation	® copy pp. 22-23
4	Sept. 17	The Microscope; The Cell	® draw, describe cell/organism
5	Sept. 24	Aquatic Ecology	® p. 196 + draw, describe organism
9	Oct. 22	Monera, Protista, and Fungi	® Results and describe
10	Oct. 29	Foraging Strategies	® Graph and discussion
12	Nov. 12	Molecular Biology	® Ethics of DNA use
14	Nov. 26	Field trip to DFM	® Obscure food
15	Dec. 3	Animal Diversity	® Describe feeding behaviour