

## **Biology 242**

### **Animal Architecture and Physiology with Laboratory-Fall 2008**

**Steve Baker**  
**Office: Pierce 117**  
**Phone: 784-8446**

#### ***Course Objectives:***

1. Survey of the form and function of the invertebrate animals and protests with emphasis on classification, life histories, ecological adaptations, and medical importance. Describe *connections* between invertebrate phyla based on their development, evolutionary adaptations, and comparative anatomy.
2. Review of basic vertebrate biology and classification (lab) and physiology (lecture).
3. Develop scientific writing and research skills

#### **Laboratory includes:**

- a. a review of classification and further study of animal architecture through dissection
- b. the examination of demonstration material illustrating representative organisms from each phylum and including information about the classification, ecology, and life history of each.
- c. continued emphasis on the study of biology through investigative means; including three major research investigations and several other smaller investigations addressing the physiology or behavior of various invertebrate groups.

## ***Tentative Lecture Schedule:***

<b>Week</b>	<b>Date</b>	<b>Topic(s)</b>	<b>Readings (13<sup>th</sup> ed.)</b>
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### ***Review of Invertebrate Diversity***

1.	8/27-8/29	Intro to course, Protista	Ch. 11
2.	9/1-9/5	Protista, Porifera	Ch. 11, 12 (sponges only)
3.	9/8-9/12	Porifera / Cnidaria/ Introduction to Development	Ch. 12, 13, 8
4.	9/15-9/19	Architecture Platyhelminthes	Ch. 9, 14

### **EXAM 1    9/18,    PIERCE 101, 8 AM, COVERS THROUGH DEVELOPMENT**

5.	9/22-9/26	Pseudocoelomates	Ch. 15 (Rotifera, Acanthocephala) Ch. 18
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### ***Final Report, Stentor Investigation: Due on or before 10/1 at beginning of class***

6.	9/29-10/3	Mollusca	Ch. 16
7.	10/6-10/10	Annelida Echinoderms	Ch. 17

### ***Fall Break! October 13-14***

### **EXAM 2, 10/9, PIERCE 101, 8 AM, COVERS THROUGH MOLLUSCA**

8.	10/15-10/17	Echinoderms, Prechordates Introduction to Chordata	Ch. 22, 23
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### ***Review of Vertebrate Physiology***

#### ***IN PHYSIOLOGY READINGS, REVIEW AND EMPHASIZE VERTEBRATE MATERIAL ONLY***

9.	10/20-10/24	Tissues, Skin, Bones	P. 192-197, Ch. 29
10.	10/27-10/31	Bones, Muscles	Ch. 29

- |     |           |             |        |
|-----|-----------|-------------|--------|
| 11. | 11/3-11/7 | Circulation | Ch. 31 |
|-----|-----------|-------------|--------|

***Final Report, Regeneration Investigation, due on or before 11/3 at beginning of class***

**EXAM 3     11/6, PIERCE 101, 8 AM, COVERS THROUGH MUSCLES**

- |     |               |   |            |
|-----|---------------|---|------------|
| 12. | 11/10-11/14   | Gas Exchange, Introduction<br>to Immunity, Reproduction | Ch. 31, 35 |
| 13. | 11/17 - 11/21 | Digestion/Excretion                                     | Ch. 32     |

**November 26-28, Thanksgiving Break**

- |     |       |                                |        |
|-----|-------|--------------------------------|--------|
| 14. | 11/24 | Excretion cont., /Reproduction | Ch. 30 |
|-----|-------|--------------------------------|--------|

***12/4 Poster Day! Poster presentations summarizing Daphnia investigation***

- |     |           |                  |        |
|-----|-----------|------------------|--------|
| 15. | 12/1-12/5 | Neural Control   | Ch. 33 |
| 16. | 12/8      | Chemical Control | Ch. 34 |

***Note: I reserve the right to modify this syllabus and course information if I deem it necessary.***

***Course Information:***

**I. Text:**     **Integrated Principles of Zoology, by Hickman, Roberts, Larson, et al.**  
The newest edition is the 14<sup>th</sup>; you may be able to get by with an earlier edition if one is available. See me if you have questions.

**II. Laboratory:** **A. General Zoology Laboratory Guide, by Charles F. Lytle.**  
Current edition is the 14<sup>th</sup>.

**B. Dissection Kit (required)**

**C. Additional Materials--** You may want to buy (share with a friend) a copy of the Rust book for Biology Labs if you didn't last semester, as well as the "writing about biology" handbook. Both will be very useful.

**D. Lab Format:** Lab will include:

1. Demonstrations of representative specimens of major animal groups

2. Observations and dissections of selected specimens, including frog and fetal pig
3. Investigative activities which may require oral presentations and/or written reports.

### III. Additional Course Information

This class has a web site which you will find helpful. It is trying to “recover” from being moved to the new Oxford site, but it at least usable as is. Many of the web sites, photomicrographs, and study hints will be very useful. Some study questions are posted with web sites linked to each lab; you are responsible for these on the lecture quizzes. Here is the web site:

[http://www.oxford.emory.edu/audiences/current\\_students/academics/classes/baker/biology\\_242/](http://www.oxford.emory.edu/audiences/current_students/academics/classes/baker/biology_242/)

- This class has a learnlink conference in which you may post questions or discuss with the instructor or other class members. Look here for class news and study hints. I will check it regularly, and I will encourage you to do the same.
- In Biology 242, you are responsible for all lecture material AND some material covered in your text readings. Pay particular attention to assigned reading topics and to broad topics not covered in lecture. We will discuss as a class expectations regarding learning material in textbook that are not covered in the lecture.
- I use the (+/-) scale for grading.

Tentative point totals for grading are as follows:

Exams 3 @ 100	300
Lab Exams 4@50	200
Lab Write-ups and Additional Writing	75
(two formal lab reports and one poster @25 each)	
Final Exam	175

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Total	750
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- Your attendance will definitely influence your grade. Roll will be taken frequently, and frequent absences will lower your course grade, particularly in students with borderline averages. Conversely, excellent attendance will likely improve your grade. Please read the departmental attendance policy and see me if you have questions.
- Tardiness is exceptionally rude and a history of regular tardiness will also have a negative impact on your grade.

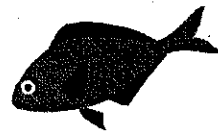
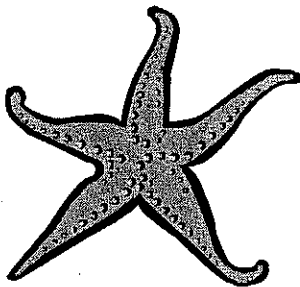
- Cell phones must be turned off during lecture and lab time. Camera phones and cameras of any sort are not to be used during lecture exams or at any time in the laboratory.
- Exams generally are not made up, unless you have a family emergency or severe illness. If you must miss the exam, you need to let me know ASAP. Exams are typically not rescheduled due to class conflicts or "rough weeks"-- it is part of your job to plan ahead for such contingencies.

#### **IV. Honor Code:**

I adhere strictly to the Honor Code and will advise you as the course proceeds regarding rules for citation, group work, etc.

#### **V. Miscellaneous/Office Hours**

I am generally in or around the office from 8:30-9:30 MWF, 9-11 TTh, or you can make an appointment at other times. You will find that I am on campus from about 8:30-5:00 every day unless I am in the field or have family commitments. I welcome the chance to talk to you, whether it involves class work or is just to visit!



**Biology 242**  
**Laboratory - Fall 2008**

<u>Date</u>	<u>Topic</u>	<u>Reading</u>
9/4	Protista	Lytle, 5
	<b>Investigation #1--Stentor</b>	
9/11	Cnidaria and Porifera Dissection: <i>Grantia</i> , <i>Metridium</i> , <i>Aurelia</i> , <i>Gonionemus</i>	Lytle, 6-7
9/18	Platyhelminthes	Lytle 9
<b>9/25</b>	<b>LAB EXAM 1, PIERCE 119, 8 AM, THROUGH PLATYHELMINTHES</b>	
9/25	Field Sampling; Bear Creek Pseudocoelomates/ Weather Buffer, Demos available this week	
10/2	Pseudocoelomates Dissection: <i>Ascaris</i> Mollusca Dissection: <i>Venus</i> , <i>Loligo</i>	Lytle 10 Lytle, 11
10/9	Annelida Dissection: <i>Lumbricus</i> <b>Investigation #2, Regeneration</b>	Lytle, 12
<b>10/16</b>	<b>LAB EXAM 2, PIERCE 119, 8 AM, THROUGH ANNELIDA</b>	
10/16	Arthropoda Dissection: <i>Procambarus</i> <i>or Callinectes</i>	Lytle, 13
10/23	Echinoderms, <i>Amphioxus</i> , Demos: Echinoderms, prechordates, primitive fishes	Lytle, 14, 15
10/30	Vertebrate Tissues Dogfish, <i>Rana</i> (bones, skin frog) Demos: Teleost fishes, amphibians	Lytle, 16, 18, 2

11/6                      **Investigation #3—Cardiac Physiology**  
Open lab for work or review

**11/13              LAB EXAM 3, PIERCE 119, 8 AM, THROUGH RANA BONES**

11/13                      *Rana* (musculature, cow heart)      Lytle, 18; 319-320.  
Demos: reptiles, birds  
Begin internal if desired

11/20                      Mammal demos  
*Rana* internal

***Thanksgiving Holiday—November 26-28***

12/4                      *Sus*                                      Lytle 19

**12/9              LAB EXAM 4, PIERCE 119, 8 AM, THROUGH *SUS***



## ABSENCE POLICY - Biology Department

All students are expected to attend all lecture and laboratory sessions. However, emergencies may arise which will necessitate absences from class. Students are allowed 4 cuts in lecture and NO CUTS in lab. Students may only miss lab without penalty in cases of illness, family emergency or a school sponsored event which is cleared with the professor in advance. Students are responsible for all material which is covered in laboratory and lecture. When possible, students will be allowed to "make-up" laboratory material missed due to an excused absence, however, because of the nature of laboratory material, actual "make-up" of missed activities is usually impossible.

### PENALTIES

Students who exceed the 4 cut limit in lecture for whatever reasons or have an unacceptable absence from laboratory will have their FINAL grade reduced 5 points per absence. Students who miss 2 labs without acceptable reasons will fail the course (see below).

### LECTURE ABSENCES:

THERE ARE NO EXCUSED ABSENCES FOR LECTURE. Each student may be absent four times without penalty. These four cuts may be used for any reason: illness, studying, travel, family emergency, etc. However, ANY additional cuts will result in grade reduction. USE YOUR CUTS JUDICIOUSLY, e.g. for sick leave only.

### ACCEPTABLE LABORATORY ABSENCES

Although no discretionary absences, i.e. "cuts", are allowed regarding laboratory, on rare occasions, illness, family emergencies, or certain school sponsored events may make it necessary for a student to miss a laboratory session. The instructor MUST be notified prior to the day of the absence in all but the most extreme emergencies.

In all cases, the final decision regarding whether or not an absence is acceptable will be made by the instructor.

AN UNACCEPTABLE ABSENCE FROM LABORATORY RESULTS IN A FIVE POINT REDUCTION IN THE FINAL GRADE. TWO UNACCEPTABLE LABORATORY ABSENCES RESULT IN FAILURE OF THE COURSE.

### MISSED TESTS

Ordinarily, tests cannot be made up, however, this is up to the instructor. If a student misses a test, and the absence is acceptable the missed test will not count either for or against the student. If the absence is not excused the grade will be a zero. Students are cautioned that any excuse for missing an exam will come under severe scrutiny by the instructor. THE INSTRUCTOR MUST BE NOTIFIED PRIOR TO THE TIME OF THE EXAM, AND THE INSTRUCTOR MAKES THE FINAL DECISION REGARDING WHETHER OR NOT AN ABSENCE IS ACCEPTABLE.

Laboratory tests which are missed for a reason that is excused MUST be made up. The instructor must be notified prior to the time of the test.

### RELIGIOUS HOLIDAYS:

Students must notify the instructor one week in advance if they intend to be absent for a religious holiday.

### TARDINESS

Being late to class is rude and distracting. Continued tardiness by any student will result in the assignment of absences and ultimately a reduction in the student's grade. Three tardies equal an absence. The tardy student is responsible for notifying the instructor that she/he entered the classroom late and, therefore, was not absent. The instructor reserves the option of excluding a person from further classroom or laboratory participation if the student is continuously tardy.

Falsification of information regarding absences from class or laboratory will be considered as a breach of academic integrity.



# CLASSROOM AND LABORATORY GUIDELINES

## Department of Biology

- I. Eating and drinking are not allowed in either classrooms or laboratories. Therefore, do not bring food items and beverages to class or laboratory. Remember that the use of tobacco in any form is forbidden in Pierce Hall.
- II. Students are expected to wear appropriate attire in classrooms and laboratories. This certainly includes the wearing of shoes.
- III. Students must be safety conscious at all times but especially in the laboratories. Special procedures will be reviewed during laboratory sessions as needed.
- IV. All students are requested to help with housekeeping in the classroom and laboratory.
- V. In Biology 142, 121, and 122 certain designated dissection specimens may be taken from the laboratory with the instructor's permission. The instructor will identify those specimens which may be removed for study elsewhere. These specimens must be returned on or before the time the instructor announces for their return.
- VI. Except for the exceptions noted above (V) materials may not be taken out of the laboratories. This includes microscopes, microscopic slides, demonstration notes and materials, charts, and all other items which are to be found in the laboratory.
- VII. Violation of any regulation noted in Sections V and VI above will be treated as a breach of academic integrity. Therefore, such violations will be immediately reported to the Honor Council.



***Proposed Lecture Syllabus  
Class Information  
Biology 245  
Fall, 2008***



**Instructor: Dr. Steve Baker  
Pierce 117**

**COURSE OBJECTIVES:**

1. Students will acquire a basic knowledge of freshwater ecological principles in stream, lake, and wetland ecosystems.
2. Students will learn the skills and techniques needed to identify most aquatic invertebrates to the taxonomic level of genus.
3. Students will learn techniques for evaluating water quality of streams and lakes based on the evaluation of the pollution tolerances of the organisms they contain.
4. Students will put their new knowledge to work by practical, hands-on field investigations of nearby lakes and streams.
5. Students will learn research skills needed to conduct scientific investigations, develop critical thinking skills used to evaluate their data, and present their results to the class.

**COURSE SYLLABUS:**

**This syllabus is tentative and subject to change due to weather or other needs.**

<u>Date</u>	<u>Topic</u>
8/28	Course Introduction Bioassay; Project I Overview
9/2	Taxonomy and M and M's
9/4	Aquatic Biology Case Study
9/9	Student Presentations/Case studies Intro to Scientific Writing
9/11	Start your project! Biomonitoring, Sampling Design, and Rapid Bioassessment Protocols

9/16	Water Quality Parameters/Environmapper
9/18	Water and Your Health
9/23	Introduction to Stream Ecology Geomorphology Temperature and Light Influences Stream channel characteristics Riparian Zones
9/25	Life at the Bottom - role of benthos in stream ecosystems Habitat adaptations
9/30	Energy Flow: River Continuum Concept
10/2	Benthic Movements: Drift Colonization Periphyton
10/7	Student Presentations: Major Insect Orders
10/9	Student Presentations
<b>10/13-10/15</b>	<b><i>Fall Break! Go collect!</i></b>
10/16	Stream Fishes
10/21	Introduction to Lake Ecology Classification Temperature and Stability Water Quality
10/23	<b>Lecture Exam I</b>
10/28	Bear Creek, Quantitative Sampling / Fish Collection
10/30	Plankton
11/4	Aquatic Macrophytes, Lentic Insects and Fishes
11/6	Introduction to Aquaculture
11/11	Trip to Buford Fish Hatchery
11/13	Aquaculture II, Intro to Fisheries Management
11/18	Fisheries Management/Farm Ponds
11/20	Human Impacts I

11/25                      Student Project Presentations: **2007 Freshwater Ecology Symposium**

**11/26-11/28                      Thanksgiving Holiday**

12/2                      Human Impacts II

12/4                      Endangered and Exotic Species

12/9                      Course wrap-up

### **Evaluation:**

**These are general guidelines for evaluation and may vary somewhat!**

<b>Midterm</b>	<b>15%</b>
<b>Final Exam</b>	<b>15%</b>
<b>Bioassay Project and Report</b>	<b>7%</b>
<b>Presentation (insect order)</b>	<b>7%</b>
<b>Research Project and Presentation</b>	<b>18%</b>
<b>Aquatic Invertebrate Collection</b>	<b>15%</b>
<b>Lab Quizzes</b>	<b>15%</b>
<b>Field Book, etc.</b>	<b>3%</b>
<b>Participation</b>	<b>5%</b>
<b>Total</b>	<b>100%</b>

**Plus (minus) grading will be used.**

### **Miscellaneous Course Information:**

- **Text:** An Introduction to the Aquatic Insects of North America, by Merritt and Cummins. Third Edition. This is an identification guide to many of the organisms you will collect. Other identification guides, handouts, and reserve materials will also be available for your review. There are copies available in the lab for you to use, or you may buy one online if you choose.
- **Learnlink:** A learnlink conference is available and will be very important in this course. It is a useful forum for course information, study tips, open lab times, and field trips by the class or individual class members. You should place it on your desktop.
- **Blackboard Site:** A blackboard site is available for this course. It is accessible at <http://classes.emory.edu>.
- **Absence Policy:** The departmental policy will be distributed. Note that excessive absences or tardies can result in a reduced grade for the course.
- **Office Hours:** My office hours will be 9-11 TTh, 11-12 MWF. You will find that I am around almost all day and eager to visit with you at any time. My office is next door to the lab so I am often able to help out if you have a problem identifying an organism in the lab.

- **Honor Code:** I enforce this strictly. We will discuss in the class specific ways in which you may share work on projects and cite references in research write-up. When in doubt, ask!
- **Health Related Issues:** Weather permitting, we will be outside almost every week. Also, you will be expected to go out on your own with other class members to do your field work. Please let me know confidentially if you have any health problems that might be influenced by these field activities.
- **Cell Phones:** They must be turned off in class/lab. They are welcome on field trips for safety!

### **Additional Notes:**

It is very important that you do not get behind on your lab and field work! Projects have multiple deadlines as they are done in stages to prevent your procrastination :) but keeping ahead will definitely help your grade!

The student project will consist of a research project conducted **with a lab partner** and presented to the class. It will involve a field oriented project and will include a written report.

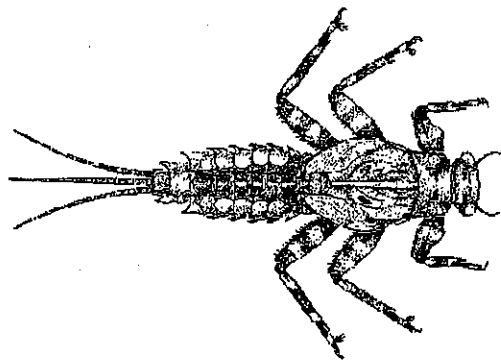
An invertebrate collection will be prepared by **each student** throughout the semester. Organisms will include those collected on lab trips, specimens obtained in project work above, but must also include out of class sampling trips taken with another member of your class.

Field book will include notes taken in the field and documentation of your personal sampling trips.

More detailed information about these class components will be distributed at a later date.

## ***Tentative Lab Syllabus / Biology 245 Fall, 2007***

9/2	Introduction to Use of Taxonomic Keys Solution and Bioassay Prep
9/9	Collect: Croom Creek, Land Application Area
9/16	Collect: Yellow River or Alcovy River; Large Stream Sampling
9/23	Lab Day: ID / Collection Prep
<b>9/30</b>	<b>Keying Quiz I</b>
10/7	Bioassessment Investigation
10/21	Lentic Sampling, City Pond or other area lake
10/28	Quantitative Sampling/Fish Collecting Bear Creek
<b>11/4</b>	<b>Keying Quiz 2</b>
11/11	Buford Fish Hatchery
11/18	Plankton
11/25	Work on Projects
12/2	Aquatic Techniques: Chironomid Mounting and ID Age and Growth of Fish Food Habits
<b>12/9</b>	<b>Final Keying Quiz</b>



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