## Lecture Information

**Professor:**
Dr. Zachary Cheviron
Office: 433 Morril Hall
Email: cheviron@illinois.edu
Phone: 244-2787
Office Hours: 2:30-4:30 Monday or by appointment

**Schedule:** 1:00 – 1:50 PM, MWF 100 Gregory Hall

**Text:** Biological Science, 4th edition, Scott Freeman, 2011, Pearson Benjamin Cummings, ISBN 0-32-159820-2

**Course Web Site:** Materials for the course will be posted on the course moodle site: https://moodle.life.illinois.edu

## Exams and Grading

### Course Grading Philosophy

1) I do not 'curve' individual exams or assignments. Instead, I will assign grade cut off points based on the distribution of student point totals at the end of the semester.

2) I use the standard 90, 80, 70, 60% scores as starting cutoff points for A, B, C, and D grades, respectively. Depending on the distribution of points at the end of the semester I **may** drop the cut off points slightly (e.g., 88% might become the A cut off) but **I will not raise** the cut-offs.

3) I do not give out minus grades. Students who would get an A- under a traditional grading scheme will get a grade of A. A small number of students at the upper end of each range **may** get plus grades; this is determined by the point distribution, not by an absolute score below the cut-off for the next letter grade.

4) Historically our distribution has broken down as follows (A: 20-25%, B: 45-50%, C: 20% , D/F: 10%)

5) I will use the iClicker to evaluate student responses on in-class quizzes and in group exercises. 10% of your grade will come from your iClicker responses in these assessments. Students will receive 1 point if they answer 75% of the questions in a given lecture regardless of the answer. I typically ask several questions per lecture. Students will receive an additional half point for each question they answer correctly. It is your responsibility to bring your iClicker to lecture. We have no mechanism to account for missed iClicker responses.

Reading assignments for the lectures are provided on the course Moodle site. **Our expectation is that you will read this material before coming to class.** Material from the text will be covered

quickly and used as a starting point to explore topics in more detail. **Similarly, all of the laboratory materials will be posted on Moodle. Our expectation is that you will read the introductory material in your laboratory manual before coming to the lab each week (see below)**. Each lecture will begin with several iClicker questions that will draw from the assigned reading material.

**Exams**

Exams covering lecture material will be held during the regularly scheduled lecture period; see the lecture schedule for exam dates. **Note that these exams may not be held in the lecture room.** Exams can be made up with proper excuse and documentation, but will be prorated. If you are ill, a doctor's or McKinley letter – **a note from the Emergency Dean does not substitute for a doctor's excuse**. You must contact the appropriate staff member before the exam or as soon as possible after the exam to ensure that your absence is excused and that a makeup exam can be scheduled.

**Lecture Grade:** 60% of course grade: 20% for each of 3 exams

**iClicker Questions and in-class exercises:** 10% of course grade

**Point Allocation**

Exams - 60%
In-class quizzes and group exercises - 10%
Lab - 30%

**Lab Information**

**Location:** 313 Natural History Bldg.
**Coordinator:**
Nick Morphew
Email: morphew2@life.illinois.edu
Office: 300 NHB
Phone: 244-7350

**Teaching Assistants:**
Zachary Bergeron (zberger2@illinois.edu)
Michael Grispo (mgrispo@gmail.com)
Catherine Hughes (cdhughe2@illinois.edu)
Vincent Husted (vhustad@illinois.edu)
Maria Stager (stager2@illinois.edu)

**Lab Grade:**

Your grade in the lab portion of the course will determine 30% of your overall course grade, and your lab grade will be determined by your combined performance on quizzes, write-ups, in-class presentations and your level of participation in class discussion. Your lab TA will provide detailed information on the

Briefly, you will perform a total of five lab exercises over the course of the semester: a introductory comparative anatomy lab exercise during the first week lab (you will be quizzed over this material), followed by four three-week extended lab exercises. Each of the four three-week lab exercises will follow the same schedule. **In the week 1**, you will learn important background information and specific skills that will be needed to perform a guided independent experiment of your own design in week 2. Your grade in week 1 will be given based on a write-up describing an experimental design for guided group project that must be turned to your TA by the end of lab period. **Week 2** will be dedicated to performing the group experiment that you designed in week 1

and the week lab period will begin with a quiz over the background material. In **week 3**, you will present the results of your independent as a 15-minute powerpoint presentation to your lab section. Your lab TA will provide detailed information on our expectations for these write-ups and presentations.

You will be allowed to drop your lowest quiz, write-up, and presentation scores, **if you attend every lab in that section (or have an excused absence)**. This policy allows for an excused absence (e.g. illness or emergency). If more than the required number of lab reports are submitted, the highest 10 scores (3 presentations, 3 experimental design write-ups and 4 quizzes), will be used to compute the lab grade. Finally, the remaining 10% of your lab grade will be determined by your participation in class discussions and 'question and answer' sessions following group presentations. Again, your TA will provide detailed information on how your participation grade will be determined.

Lab Point Allocation (300 pts. total – 30% of total course grade):
Presentations: 60% of lab grade (3 highest grades count; 60 pts. each.)
Quizzes: 20% (4 highest scores; 15 pts. each)
Experimental Design Write-ups: 10% (3 highest scores; 10 pts. each)
Participation: 10% (30 total pts. available).

**Lab Attendance Policy:**
Attendance is expected at all scheduled laboratory sessions. Because of limitations on lab space and staffing, missed labs cannot be made up beyond the weeks for which they are scheduled. Limited accommodation of students with conflicts may be made in other lab sections – **this must be cleared with Dr. Cheviron at least one week in advance of the anticipated conflict.**

**Laboratory Safety**

Potentially hazardous reagents and materials are employed in modern biology. As is the case with any tool, these are hazardous only when handled improperly. **One way to ensure your personal safety is to read the laboratory instructions carefully before coming to class and to adhere to the following general instructions when you are in the lab.**

- Wear close-toed shoes (NOT sandals) at all times in the laboratory.
- Do NOT store, prepare or consume food or beverages, including coffee, in the laboratory.
- Keep drawers and cabinets closed when you are not accessing materials inside.
- Keep bottles, reagents and equipment away from the edges of counters and benches.
- Clean up any spills immediately.
- Learn the locations of safety and first aid equipment and use them when appropriate.
- Wash your hands before leaving the laboratory.
- Clean your lab bench after exercise, including the floor area if necessary. Discard any hazardous or biological materials according to the instructions provided by the Teaching Assistants.

**Coats, backpacks and other personal belongings:**

The IB 202 lab space is rather cramped. To avoid injuries that could result from students or instructors tripping over backpacks or coats hung over the backs of chairs it is critical that these

items be placed in the designated storage area. The lab book, a notebook and writing implements are the only items that should accompany you in your lab space.

**Sharps:**

Many of the exercises you will perform in the laboratory will involve dissections using razor blades or other cutting instruments. A specially designated "sharps" container will be available for disposing of used blades. Do not discard these items in the lab trash containers and do not leave them lying around on the lab benches after completing your work. The sharps container is also the appropriate place to dispose of any broken glassware.

- Do not use a double-edged razor blade as is out of the package. Carefully bend and break them in half to form two single-edged blades and cover the broken side with a piece or two of lab tape to prevent cuts.
- Do not pick up broken glass with bare hands. Use gloves or sweep up. Wet paper toweling can be used to collect fine pieces of broken glass.

**Chemicals:**

Some potentially hazardous chemicals will be used in the laboratory exercises. The Teaching Assistants will point these out at the beginning of each lab period and instruct you how to safely dispense, use and dispose of these materials.

- Never pour organic chemicals down the laboratory sink: they will be collected in specially marked containers. Should some organic reagents be accidentally discarded in the sink, flush them down the drain with large amounts of tap water.
- In some experiments the use of safety goggles/glasses is recommended to prevent eye damage.
- Never mix organic solvents with strong acids.

**Computers:**

- It is inappropriate to use lab computers for checking and sending email, with the exception of exchanging electronic data files generated in the lab. Web surfing and visiting chat rooms or social networking sites on lab computers is not acceptable activity.
- Students may not make changes to computer settings, folders or programs.
- No software may be loaded onto course computers.
- With the exception of LoggerPro, computer software may not be copied. Software piracy is a crime.

| Week | Date | Module | Topic |
|---|---|---|---|
| 1 | 22-Jan | Introduction | Introduction to course, physiological challenges faced by animals, and maintenance of homeostatsis |
| | 24-Jan | Gas exchange and Respiration | Gas transfer in air and water |
| 2 | 27-Jan | | Respiratory pigments and functional properties of hemoglobin |
| | 29-Jan | Circulation & Cardiovascular System | Open versus closed circulatory systems, Functional properties of the human heart and comparison to other vertebrates |
| | 31-Jan | | **Respiratory Reponses to extreme conditions: hypoxia and mountaineering** |
| 3 | 3-Feb | | Mammalian circulatory system, regulation of circulation |
| | 5-Feb | | Regulation of gas transfer, consequences of O2 limitation: Aerobic versus anaerobic metabolism |
| | 7-Feb | | **Cardiovascular responses to extreme conditions: hemorrhage, diving and exercise** |
| 4 | 10-Feb | Osmoregulation and excretion | Problem of water balance in terrestrial and aqueous environments, excretion of nitrogenous wastes |
| | 12-Feb | | Osmoregulatory organs I: the mammalian kidney |
| | 14-Feb | | Osmoregulatory organs II: nonmammalian kidney and extra renal organs |
| 5 | 17-Feb | | **Water balance in extreme environments: deserts and lifeboats** |
| | 19-Feb | | Catch-up day, Exam review |
| | 21-Feb | **EXAM 1** | |
| 6 | 24-Feb | Acquiring energy: metabolism and digestion | Overview of animal feeding strategies and dietary influences on gut structure |
| | 26-Feb | | Overview of mammalian digestive system, gastrointestinal secretions, nutrient uptake and transport |
| | 28-Feb | | Cellular metabolism |
| 7 | 3-Mar | | **Digestive responses to extreme conditions: starvation and gluttony** |
| | 5-Mar | Expending energy: maintenance and exercise | Metabolic rates, thermoregulation and exercise |
| | 7-Mar | | Introduction to musculature, mechanics and energetics of muscle contraction |
| 8 | 10-Mar | | Nonshivering thermogenesis and 'leaky' mitochondria |
| | 12-Mar | | Growth and maintenance |
| | 14-Mar | | **Metabolic responses to extreme conditions: cold, torpor, and hibernation** |
| 9 | 17-Mar | Immune system and animal defenses | Introduction to the primary mammalian defense systems |
| | 19-Mar | | Specific versus nonspecific immunity |
| | 21-Mar | | Humoral and celluar immune responses: B-cells, T-cells and MHC |
| 10 | 31-Mar | | **Malfunctioning of the immune system: Anaphylaxis and autoimmune diseases** |
| | 2-Apr | | Catch-up day, Exam review |
| | 4-Apr | **EXAM 2** | |
| 11 | 7-Apr | Sensing and responding to the environment: the nervous system | Introduction to the vertebrate nervous system: organization and evolution |
| | 9-Apr | | Nerves and membrane potentials |
| | 11-Apr | | Chemical senses and mechanical senses |
| 12 | 14-Apr | | Vision: the vertebrate eye and photoreception. |
| | 16-Apr | | **The nervous system, psychoactive drugs and addiction** |
| | 18-Apr | The endocrine system and animal hormones | Introduction to the mammalian endocrine system |
| 13 | 21-Apr | | Physiological effects of hormones I: development, reproduction, and stress |
| | 23-Apr | | Physiological effects of hormones II: development, reproduction, and stress |
| | 25-Apr | | **Pollution, hormones and society: endocrine distributors in the environment** |
| 14 | 28-Apr | Reproduction | Overview and mechanisms of sexual reproduction |
| | 30-Apr | | Overview of mammalian reproductive system, evolution of reproductive systems in vertebrates |
| | 2-May | | Hormonal regulation of reproduction, pregnancy, and birth in mammals |
| 15 | 5-May | | **Manipulating the human reproducitve system: Birth control and infertility treatments** |
| | 7-May | | Catch-up day, Exam review |
| | | **FINAL EXAM** | |