

**Course description:** Comparative concepts of animal physiology, including physiological control mechanisms operating at cellular, tissue, organ, and systems levels in invertebrates and vertebrates. 4-credits  
(Prerequisite: BSC 121 and CHM with grade of C or better, one 300-level BSC core course)

**Lecture:** 374 Science Building  
**Lab:** 387 Science Building

**Times:** T & Th 11-12:15  
**Times:** M 9-11:50

**Grading:** Letter grades will be assigned as follows:

Proportional point allocation for the course:

*I do not offer extra credit assignments.*

**Labs:** Your laboratory performance will contribute 36.4 % of your total course grade. This will be determined from laboratory data analyses and submitted lab reports. All lab reports are to be handed in, in printed paper form, at the beginning of the lab on which they are due to considered on time. Late reports will be penalized. I do not accept electronically submitted reports. Details about what will be required for each lab report will be given at the time of each laboratory experiment.

**Final Presentation:** One the last day of laboratory, 12/1, you will give a 15 minute presentation using combined data from one of the labs during the semester. You will be graded on your ability to synthesize, explain, present and respond to questions about the data. More details will be given closer to the date.

1. UNIVERSITY POLICIES: By enrolling in this course, you agree to the Marshall University Policies (listed in the link below). Please read the full text of each policy by going to [www.marshall.edu/academic-affairs](http://www.marshall.edu/academic-affairs) and clicking on “Marshall University Policies.” Or, you can access the policies directly by going to [http://www.marshall.edu/academic-affairs/?page\\_id=802](http://www.marshall.edu/academic-affairs/?page_id=802) for Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment.

2. **ATTENDANCE POLICY:** Attendance in lectures is expected and is required for laboratory exercises. Students are responsible for all activities and announcements that occur during lecture and lab. Students are responsible for any material missed. Missed information should be obtained from classmates. Missed lectures will influence your participation grade.

Absences and from exams or labs due to illness, death in the family, or institutional activities will be excused only with an official university excuse from the MU Student Affairs Office (MSC 2W38). Make-up exams will only be administered for excused absences. Missed labs may not be able to be made up given the nature of the course and the labs. The instructor must be notified within 10 days of the missed exam in order to be eligible for a make-up exam (see Policy 1).

Students are expected to be on time for lectures, labs, and exams. Arrival for an exam after the first person has handed in their exam will result in you not being allowed to take the exam. Late arrival to the lab may result in you not being allowed to participate in the lab at the instructor's discretion.
3. **COMPUTER LITERACY:** Course materials and course announcements are located on MUOnline (<http://www.marshall.edu/muonline>). Notify me within the first week of class if you cannot access these.
4. **STUDENTS RESPONSIBLY:** *Students are responsible for reading the appropriate material from the textbook, posted readings, and lab handouts prior to the lecture or lab meeting.*

*Students are required to stay on task during the lecture and laboratory exercises.* Students may be asked to work in groups during class time and as part of following protocols in lab.

*Communications from the instructor* may come via your Marshall E-mail account, MUOnline and/or lecture. It is your responsibility to check both your Marshall email account and MUOnline announcements regularly.

*Electronic communications to the instructor must have BSC 422 in the subject line, include your full name and lab section in the message, and be written formally.*
5. **RECORDS:** *Grades will not be given or discussed over the phone or e-mail.* You must be present during lecture or lab to collect graded exams, quizzes, and lab reports. Students should keep all returned exams score sheets and lab reports so that their relative standing in the course can be known at any time. All grades appeals must be done formally in writing and with 10 calendar days of the returning of the graded item to the student.
6. **ELECTRONIC DEVICES:** Only electronic devices (laptops or calculators) actively being used in the course are permissible. All other electronic devices must be turned off or silence and put away during class and lab. *Failure to do so may result in your dismissal from that lecture period or laboratory exercise.* Only standard calculators will be permitted during examinations; cell phones, handheld computers, PDA's, laptops, or the like will not be permitted. Do not come to exams unprepared. Audio or video recording of lectures is not permitted without prior consent of Dr. Kovatch.

**Student Learning Outcomes: BSC 422/522**

| <b>Course Outcomes</b>  | <b>Opportunities to Practice Course Outcome</b>   | <b>Course Outcome Assessment(s)</b> |
|---|---|-------------------------------------|
| Articulate and describe the concepts of animal physiology at multiple levels of organization                  | In-class discussions, laboratory experiments, and reading of primary literature               | Examinations                        |
| Discuss and use the scientific approach to solve problems within the field of physiology                      | In-class discussions, laboratory experiments, and reading of primary literature               | Examinations and laboratory reports |
| Read, analyze, and interpret data, figures, tables and associated statistics conveying scientific information | In-class discussions, laboratory exercises and experiments, and reading of primary literature | Examinations and laboratory reports |
| Collect, interpret, present and discuss physiological data  | Laboratory experiments  | Laboratory reports                  |

**Tentative Course Schedule****BSC 422/522 Fall 2014**

| <b>Date</b> | <b>Topic</b>                           | <b>Text Readings</b> |
|-------------|--|----------------------|
| 8/26        | The animal's environment               | 1                    |
| 8/28-9/2    | Thermodynamics and cellular metabolism | 2                    |
| 9/4-9       | Animal energetics                      | 15                   |
| 9/11        | No lecture                             | 15                   |
| 9/16-28     | Temperature                            | 15                   |
| 9/23-25     | N Membrane Physiology                  | 3                    |
| 9/30        | Neural Physiology                      | 4                    |
| 10/2-7      | Sensory Physiology                     | 6                    |
| 10/9-14     | Nervous Systems                        | 5                    |
| 10/16       | Cellular Movement                      | 8                    |
| 10/21       | Organismal Movement                    | 8                    |
| 10/23       | Endocrinology                          | 7                    |
| 10/28-30    | Respiration                            | 11                   |
| 11/4-6      | Circulation                            | 9                    |
| 11/11       | Blood and Gas Transport                | 11 & 9               |
| 11/13-18    | Water and Solute Balance               | 13                   |
| 11/20       | Excretion                              | 12                   |
| 12/2-4      | Digestion                              | 14                   |
| 12/11       | Final Exam, 10:15-12:15                |                      |

### Tentative Laboratory Schedule

| Week | Date  | Topic                                | Submission            | Points |
|------|-------|--------------------------------------|-----------------------|--------|
| 1    | 8/25  | Course Intro                         |                       |        |
| 2    | 9/1   | Labor Day                            | no lab                |        |
| 3    | 9/8   | Statistics lab and Biopac tutorial   | write up with figures | 50     |
| 4    | 9/15  | RBC osmoregulation alb               | write up with figures | 25     |
| 5    | 9/22  | Butterfly optimal foraging lab       | write up with figures |        |
| 6    | 9/29  | Goldfish Q10 Lab                     | write up with figures | 50     |
| 7    | 10/6  | Goldfish Q10 Lab                     | repeat experiment     | 50     |
| 8    | 10/13 | Biopac 3 & 4                         | write up with figures | 50     |
| 9    | 10/20 | Biopac X                             | write up with figures | 50     |
| 10   | 10/27 | Biopac 1, 2 and 11                   | write up with figures | 50     |
| 11   | 11/3  | Build respirometer                   |                       |        |
| 12   | 11/10 | Metabolic Scaling Lab                | write up with figures | 50     |
| 13   | 11/17 | Urinalysis lab                       | write up with figures | 25     |
| 14   | 12/1  | grad presentations (6 @ 15 min each) |                       | 100    |
|      |       |                                      | Total                 | 500    |