

# Animal Physiology (Bio 350)

## Fall 2013

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**Lecture Instructor:** Dr. Robin Cooper

**Email:** RLCOOP1@email.uky.edu

If you email me, please allow up to 48 h for a response. Be sure to include **BIO 350** in the subject line of the email so the email will not be mistaken for junk mail.

**Office Phone:** (859) 257-5950

**Office Location:** Room 226 Biology

**Website:** <http://web.as.uky.edu/Biology/faculty/cooper/default.htm>

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**Laboratory Instructor:** Dr. Melody Danley

**Email:** mlda227@uky.edu

If you email me, please allow up to 48 h for a response. I do not generally check my email in the evenings or on the weekends. Be sure to include **BIO 350** in the subject line of the email so the email will not be mistaken for junk mail.

**Office Phone:** (859) 257-1053

**Office Location:** MDS 125 (in same building where the labs are taught)

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### Graduate Teaching Assistants

Mr. Josh Titlow, [joshtitlow@uky.edu](mailto:joshtitlow@uky.edu)

Ms. Yan Zhu [yan.zhu@uky.edu](mailto:yan.zhu@uky.edu)

Mr. Farid Yaghouby [f.yaghouby@uky.edu](mailto:f.yaghouby@uky.edu)

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### General Course Information

Credits: 4 credit hours

Lecture Location: Room 116 Biology

Lecture Time: Tuesdays and Thursdays 9:30 to 10:45 AM

**Lab Location:** Multi-Disciplinary Science Building *Multi-Disciplinary Sci Bldg-Rm 155B-MDS*

Lab Times vary as follows:

#### Lab

**Section 001: 9:00-11:50 Monday**

**Section 002 :12:00-14:50 Monday**

**Section 003: 15:00-17:50 Monday**

**Section 004: 12:00-14:50 Wednesday**

**Section 005: 15:00-17:50 Wednesday**

Students must attend only that lab section in which they are officially enrolled. If you are absent for your regularly scheduled lab time, you may not "just show up" for a different section to make-up the missed lab. If you show up unannounced and without instructor consent for a different lab section, you will be asked to leave.

**Course Description:** An introduction to the basic principles of animal physiology. An elementary discussion of the major vertebrate organ systems including nutrition, metabolism, respiration, circulation, excretion, muscle contraction, peripheral and central nervous system, and endocrine function emphasizing homeostasis. Lecture, three hours; laboratory, three hours.

**Course Prerequisites:** BIO 150-153 or equivalent introductory biology sequence, BIO 315, and CHE 105, CHE 107.

#### Official Course Text

Eckert Animal Physiology: Mechanisms and Adaptations, Fifth Edition, by David Randall, Warren Burggren, and Kathleen French.

<http://www.whfreeman.com/newcatalog.aspx?isbn=0716738635>

### Other Course Materials

You will need a scientific calculator for lecture and laboratory activities. A calculator should be brought to all lectures and labs. Use of the calculator function on a cell phone or computer is not acceptable, and will not be allowed during quizzes or exams.

There is no separate lab manual to purchase. All lecture and lab hand-outs are available for download by accessing the course website or black board or Google sites as indicated below.

For lecture content:

<http://web.as.uky.edu/Biology/faculty/cooper/Bio350-Fall2013/TEACHING350FALL2013.htm>

For lab content:

<https://sites.google.com/site/bio350animalphysiology/>

For graded work and grades:

All lab reports are submitted in electronic format through Blackboard's Safe Assign link. All grades (lab and lecture) are posted in Blackboard's gradebook.

**Organization of Bio 350 Animal Physiology:** This course includes both lecture and lab components. The lecture content is organized, presented and overseen by Dr. Robin Cooper. The laboratory content is organized and overseen by Dr. Melody Danley. In addition, each laboratory section has one TA (graduate teaching assistant) that will help guide students through the hands-on portion of the lab, as well as grade all lab submissions. Content presented in lecture and laboratories are expected to be integrative such that content on assessments in lecture or the lab can be mixed. No laboratory section will have an advantage over the others as quizzes are different for each section and lecture exams are constructed so as not to cover content that particular sections might not have been exposed to.

The "manual" for the lab exercises are posted online within the web page for each experiment. There is no separate lab manual to purchase. You will be responsible for printing out or having, in some means, the protocol to use for each laboratory period. Hard copies will not be provided. We cannot guarantee that the laboratories will have internet access during the lab period, so come prepared with a copy on your personal computer or a hard copy.

### BIO 350 Grade Progress

Grades for all exams, labs reports, journal submissions, and quizzes will be made available through Blackboard. Space is also provided in the table below for you to track your progress through the course.

Item	Max point value	Your Points Earned
Exam 1	100	
Exam 2	100	
Exam 3	100	
Exam 4 (Final Exam)	150	
Lab total points	280	
Lecture participation	20	
<b>Total Points for Course</b>		<b>750</b>

Final course are assigned based on the total points accumulated during the semester. Final course grades are assigned as follows:

675 points to 730 points = A

600 points to 674.9 points = B

525 points to 599.9 points = C

450 points to 524.9 points = D

Less than 449.99 points = E

## **Components of the grade**

**Mid-semester Exams 1, 2, and 3:** Exams will cover material from lectures, assigned readings, associated labs, and other assigned topics. Exams dates are given on the topical outline below. Mid-semester exams are not cumulative. Content for the exams comes from both lecture and lab material, and may be composed of multiple choice questions, short answer, essay, and/or fill-in-the-blank questions. Scantron forms will be provided for you. Bring a #2 pencil and your UK ID with you to each exam. **NOTE: You might not be permitted to take an exam if you do not have your UK ID with you.** Exam results and answer keys will be posted on Blackboard following the exam date.

**Final Exam:** The final exam (Exam 4) is cumulative and will cover any and all material from the entire semester. The final exam will be composed of multiple choice questions, short answer, essay, and fill-in-the-blank questions. Content for the exam will come from both lecture and lab material.

**Lecture participation 20 points:** This grade is based on your name being called in class to answer questions and participation in presenting information from group discussions. Your name will be drawn at random. If you are not present you will lose 2 points for each time your name is called. Your name may never be called during the semester and if so you automatically are given the 20 points.

**Lab Reports:** Reports are collected for every lab completed during the semester. In general, completed reports are due on Fridays of the following week. The due dates are listed on the lab schedule at the end of this syllabus, and will be posted on Blackboard as well. Each report should include the results (what was found) and discussion (what does it mean) sections plus any summarizing graphs or tables. All work must be computer generated, and properly formatted. Statistical analysis is REQUIRED and discussion of the analysis is expected. Statistical tests will be reviewed by the TA's at the ends of the lab sessions. No hand written reports (including graphs/tables) are allowed. Students that miss the hands-on portion of the lab as a result of an unexcused absence, or those failing to provide proper documentation for absences, or those that do not submit work by the submission deadline will not be allowed to make-up the missed work, submit a lab report for credit, or submit work late. For reports composed of more than one lab session of data this deduction will be made at the rate of a 50% deduction in the total points possible, per lab absence. Late assignments submitted as a result of unexcused absences will not be accepted. Such submissions (if submitted anyways) will receive an automatic **zero points!**

All lab reports must be submitted online through the Safe Assign link available on Blackboard. A separate link will be made available for each lab report due. After the deadline for the report has passed, the link is automatically deactivated, and is no longer available. If you are unable to successfully submit your report through Safe Assign, you can email a copy of the report in MS Word format, to your TA BEFORE THE DEADLINE has passed. Late submissions will not be accepted. Failure to submit your weekly lab reports will negatively affect your lab attendance points, and may negatively affect your lab report points.

A sample report will be posted on Blackboard. Reports will be used (in part) to assign lab attendance points at the end of the semester. In addition, submissions from three randomly chosen labs will be graded for lab report points. Each graded report will be worth up to 30 points (15 points for abstracts).

**Journal Manuscript:** There will be one formal journal manuscript write-up due this semester, worth up to 40 points. The manuscript is intended to mimic the research manuscript writing and submission processes required for scientific publication, and it will utilize results collected during one or two of the lab sessions. The manuscript must be written independently (no group submissions) and is due no later than Tuesday, November 20, 2012. The writing format described by the Journal of Comparative Biochemistry and Physiology - Part A: Molecular & Integrative Physiology will be used. Go to the journal's web page and look up information for authors.

## **Independent Research Project**

There will be one major project assigned as part of the lab experience, per student. This research level project is roughly the equivalent of 1 classroom midterm score. The project is composed of three parts: a proposal (10 points), a data journal (30 points), and a manuscript (60 points). The project is intended to give students the opportunity to learn how to design an experiment, utilize the techniques learned in lab, apply scientific and critical thinking skills, and write a research style manuscript similar to that required for scientific publication. The project will utilize the methods used during one of the scheduled lab activities. The

experimental design will follow guidelines provided in the laboratory by Dr. Danley and/or your teaching assistant, and posted online. Up to three students can collaborate on a single project, but final manuscripts must be written and submitted independently. Proposals and journals can be submitted as a group submission (one submission for up to 3 group members).

The research proposal is due by Monday Nov 4, 2013. The manuscript must be written independently (no group submissions) and is due no later than Monday Dec 9, 2013 by 11:59 PM. The writing format described by the *Journal of Comparative Biochemistry and Physiology - Part A: Molecular & Integrative Physiology* will be used. Go to the journal's web page and look up information for authors at:

<http://www.elsevier.com>

The "guide to authors" provided by the journal provides the formatting guidelines that must be followed for this assignment. Additional information for this assignment will be made available through lab and posted on the course website. (100 POINTS TOTAL).

### **General Course Policies**

#### **1. Return of Graded Materials**

Graded materials will not be handed back during lecture, nor will they be left in the halls or any other public location. To maintain privacy and minimize class disruption, all graded materials (other than online content) are available by stopping by my office during normal office hours, or immediately following lecture. Other pick-up times are available by appointment. In accordance with University procedures, graded materials will be held for up to one semester after the end of the course. Final exams are not returned: however, students are free to stop by my office to look over their exam.

#### **2. Questions Regarding Scores or Grades**

If you have a concern regarding your posted score/grade for a lab assignment or exam, you have 1 week (7 days) from the day the scores are posted to contest that score. After one week, the score will not be changed. It is your responsibility to check your scores and follow-up in a timely manner. We are happy to fix any errors or irregularities in grades within reason. If you feel that there was an error in grading your exam, you must submit your request in writing, detailing which questions you feel are in error and why your answer(s) should receive additional credit. For instance, if there is information in the text book that supports your answer, quote the information from the book and provide the page and paragraph number. All requests must be submitted within 1 week of posting of the answer key in order for the scores to be changed.

#### **3. Rescheduling Lecture Exams or Labs**

Students with documented excusable absences are allowed to make up missed exams or lab activities according to the following guidelines: For excused non-emergencies, students must notify the instructor at least 1 week (7 days) before the excused absence.

For lecture related excused, non-emergency absences, the student must notify Dr. Robin Cooper at least 7 days in advance of the absence.

For lab related non-emergency absences, the student must notify Dr. Melody Danley at least 7 days in advance of the absence. Make-up labs are typically scheduled for Friday morning of the same week during the excused absence. After this point, the lab materials will be put away and it may not be possible to make-up the lab.

For emergency-related absences, students must notify Dr. Danley no later than 48 hours after the missed exam or lab. Acceptable documentation must be submitted no later than 3 days, after missed assignment/exam. Excused, missed work must be completed within one weeks (7 days) of the original scheduled due date, unless other arrangements have been made with the TA/instructor.

For lecture, if you miss an EXAM #1, 2 or 3, you will have to make up the missed exam in the hour immediately following the 1<sup>st</sup> hour of Exam #4. These make-ups will be comprehensive over the entire textbook.

If you miss two lecture exams you will be encouraged to take an incomplete in the course.

In all cases, you must present a doctor's note, or other (as outlined above) to the instructors within 3 calendar days of missing any exam.

There is no make-up exam for Lecture EXAM #4 (Final). If you miss the final, you will not be able to take an incomplete in the course without discussing with us the reasons for missing the exam, and then filling out and signing an incomplete form with the department. If we feel an incomplete is warranted, we will determine the conditions necessary to satisfy the incomplete at that time.

For excused and documented absences, this course adheres to the University policy as follows:

- A. Illness of the student or serious illness of a member of the student's immediate family. The instructor shall have the right to request appropriate verification.
- B. The death of a member of the student's immediate family. The instructor shall have the right to request appropriate verification.
- C. Trips for members of student organizations sponsored by an academic unit, trips for University classes, and trips for participation in intercollegiate athletic events. When feasible, the student must notify the instructor prior to the occurrence of such absences, but in no case shall such notification occur more than one week after the absence. Instructors may request formal notification from appropriate university personnel to document the student's participation in such trips.
- D. Major Religious Holidays. Students are responsible for notifying the instructor in writing of anticipated absences due to their observance of such holidays no later than the last day for adding a class.
- E. Any other circumstances which the instructor finds reasonable cause for nonattendance. Students missing class-work due to an excused absence bear the responsibility of informing the instructor about their excused absence within one week following the period of the excused absence (except where prior notification is required), and of making up the missed work. The instructor shall give the student an opportunity to make up the work and/or the exams missed due to an excused absence, and shall do so, if feasible, during the semester in which the absence occurred.

Failure to follow this procedure on the part of the student will result in an automatic **zero points** for the missed assignment or exam! Special note: **Make-up exams will be composed of a different set of questions compared to the in-class exams given, and will contain short-answer and short essay questions.**

#### 4. Punctuality

Please do not arrive late or leave early. This is disruptive for me and for the other members of the class. If you must enter late or leave early to lecture, please sit near the exits to minimize class disruption. Get your materials out and be ready to take notes **before** you enter the classroom (i.e. do not rummage through your book bag looking for paper and a pen after you've come in 20 min late). For lab, quizzes are given during the first 10 minutes. If you are late, you will not be given extra time.

#### 5. Academic Honesty

**Cheating or committing acts of plagiarism on any graded material is not tolerated in this course!** All students are expected to uphold a basic standard of academic honesty as outlined by the University of Kentucky Senate Rules (<http://www.uky.edu/USC/New/SenateRulesMain.htm>).

*University Senate Rules Regarding Plagiarism (SR 6.3.1)*

– **Plagiarism:** All academic work, written or otherwise, submitted by students to their instructors or other academic supervisors, is expected to be the result of their own thought, research, or self-expression. In cases where students feel unsure about a

question of plagiarism involving their work, they are obliged to consult their instructors on the matter before submission.

When students submit work purporting to be their own, but which in any way borrows ideas, organization, wording or anything else from another source without appropriate acknowledgment of the fact, the students are guilty of plagiarism.

*University Senate Rules Regarding Cheating (SR 6.3.2)*

--**Cheating** is defined by its general usage. It includes, but is not limited to, the wrongfully giving, taking, or presenting any information or material by a student with the intent of aiding himself/herself or another on any academic work which is considered in any way in the determination of the final grade. The fact that a student could not have benefited from an action is not by itself proof that the action does not constitute cheating. Any question of definition shall be referred to the University Appeals Board.

**Charges of an academic offense will be made against any student that cheats or commits plagiarism on any graded course material.** Penalties for such an offense will be assessed according to the University Rules regarding Academic Offenses. For more information regarding specific procedures, visit the website [http://www.uky.edu/Faculty/Senate/rules\\_regulations/index.htm](http://www.uky.edu/Faculty/Senate/rules_regulations/index.htm) and click on any of the "University Senate Rules" links.

## 6. Classroom Behavior, Decorum and Civility

As a student engaging in a myriad of intellectual pursuits, you are expected to maintain a level of dignity and respect towards faculty, staff, and fellow students. You are expected to value differences among all members of our academic community. You have the right to take reasoned exception and to voice opinions contrary to those offered by the instructor and/or other students (S.R. 6.1.2). Equally, a faculty member has the right -- and the responsibility -- to ensure that all academic discourse occurs in a context characterized by respect and civility. Acceptable decorum and civility does not include attacks of a personal nature or statements denigrating another on the basis of race, sex, religion, sexual orientation, age, national/regional origin.

**TURN OFF YOUR CELL PHONE! Use of cell phones, iPods, or other similar electronic devices for non-class related activities while class is in session is not allowed.** Do not read newspapers, work on other assignments, or carry on conversations during class. Audio recorders for lecture are permitted. Laptops for use in taking notes are also permitted, so long as the privilege is not abused.

## 7. Disabilities and medical conditions

If you have a documented disability that requires academic accommodation, please contact Disability Resource Center so proper arrangements can be made. To receive special accommodations in this course you must provide a Letter of Accommodation from the Disability Resource Center (Room 2, alumni Gym, 257-2754; email to [jkarbes@email.uky.edu](mailto:jkarbes@email.uky.edu)) for coordination of the campus disability services available to you.

## 8. Additional Lab Guidelines

An essential component of learning in physiology requires the use of live animals. It is impossible to demonstrate the full extent of possible responses through textbooks readings or lectures. As emerging professionals, it is expected that all students will demonstrate respect and maturity when working with these animals. If any disrespect or intentional cruelty is inflicted upon the animals, it may be reason to be expelled from the course with an "I" (incomplete), "W" (withdrawal), or automatic "E" (failing grade) depending the timing and degree of the offense.

No horse play, cutting up, playing around, etc. is allowed in the laboratory. There are many students coming and going in the lab throughout the day and materials are sometimes shuffled around. Squirting someone with a solution in a syringe or a bottle can be dangerous. You might "know" it is water but another person does not. A 3M KCl solution can easily be mistaken for water, and can be very harmful if squirted by accident into someone's eye.

We may use a fixative in the lab. The fix solution is a Bouin's solution (Prepared with saturated picric acid, formaldehyde and acetic acid; Sigma-Aldrich Co.). Some people are very allergic to the vapors of formaldehyde. If you know you are allergic please inform the instructor (Dr. Danley) as soon as possible so we can make alternative plans. The fix solution is to remain in the vented hood.

Every student will have to have completed the on line safety test and bring to the lab on the 1st day of your section meeting time. It is an easy test and you can take it multiple times until you get a 100 %. Either save and email your TA, or print it out and bring it to the first lab of the semester. The TA will check you off for having completed the exercise. The website for the safety test is:  
<http://ehs.uky.edu/classes/chemhyg/chemclass.php>

**Lecture Schedule FALL 2013 Biological Sciences, Rm. 116 Tuesday & Thursday 9:30 -10:45 AM**

- 1... Th... 8/29... Introduction to course and physiology..... Chapt 1&2, 3
- 2..... T ..... 9/3..... Molecules, Energy and Biosynthesis ..... Chapt 3
- 3..... Th..... 9/5..... Membranes, Channels and Transport/ Physical basis of neuronal function..... Chapt. 4, & 5
- 4 ..... T..... 9/10..... Physical basis of neuronal function ..... Chapt. 5
- 5 ..... Th..... 9/12..... Physical basis of neuronal function & start on Chapter 6..... Ch. 5/6
- 6 ..... T..... 9/17..... Communication along and between neurons ..... Ch. 6
- ..... **Th ..... 9/19..... Exam 1 ..... Ch1- 6 parts**
- 7..... T ..... 9/24..... Communication along and between neurons..... Ch. 6
- 8 ..... Th ..... 9/26..... Communication along and between neurons ..... Ch. 6
- 9..... T ..... 10/1..... Sensory Mechanisms..... Ch. 7
- 10 ..... Th ..... 10/3..... Sensory Mechanisms ..... Ch. 7
- 11 ..... T ..... 10/8..... Sensory Mechanisms/ Organization of Nervous System ..... Ch. 7-8
- 12 ..... Th ..... 10/10..... Muscle ..... Ch. 10
- 13 ..... T ..... 10/15..... Muscle & Behavior ..... Ch 10
- 14 ... Th ..... 10/17..... Muscle & Behavior..... Ch 10 (exam review)
- ..... **T ..... 10/22..... Exam 2 ..... Ch 6-10**
- 15 ... Th..... 10/24..... Behavior..... Ch 11
- 16 ... T ..... 10/29..... Endocrine ...Hypothalamus-Pituitary ..... Chapt. 9
- 17 ..... Th..... 10/31..... Thyroid, parathyroid, adrenal and pancreas ..... Chapt. 9
- 18 ... T ..... 11/5..... Wrap up endocrine ..... Chapt. 9
- 19 ..... Th 11/7..... Cardiovascular ..... Chapt. 9 ([here](#)).
- 20..... T ..... 11/12..... Cardiovascular / Respiration ..... Chapt. 12.
- 21 ..... Th ..... 11/14..... Cardiovascular / Respiration ..... Chapt. 12.
- ..... **T ..... 11/19..... Exam 3 ..... 11, 9, 12**
- 22 ..... Th ..... 11/21..... Respiration ..... Chapt. 13
- 23 ..... T ..... 11/26..... Respiration ..... Chapt. 13
- ..... **Th ..... 11/28..... Holiday - Thanksgiving**
- 24..... T ..... 12/3..... Respiration / Ionic and Osmotic Balance.....Chapt. 13 &14
- 25 ... Th .....12/5.....Ionic and Osmotic Balance .....Chapt. 14
- 26 ... T .....12/10.....Ionic and Osmotic Balance/ Digestion .....Chapt. 14 &15
- 27 ... Th..... 12/12..... Digestion / Heat and adaptations .....Chapt. 15-17

**.....Monday 12/16/13.....FINAL EXAM @ 3:30 PM room 116**

(<http://www.uky.edu/registrar/content/final-exams-fall-2013>)

**Lab Schedule Fall 2013 (in MDS 155B, lab times vary by section)**

<b>Lab Week</b>	<b>Description</b>	<b>Associated Write-up</b>	<b>Point Value</b>
September 9, 2013	Metabolism: Oxygen Consumption in Crayfish	Abstract (Metabolism)	15
September 16, 2013	Nervous System 1: Resting Membrane Potentials in Crayfish	Report (Nervous 1 and 2)	30
September 23, 2013	Nervous System 2: Ventral Nerve Cord Activity in Crayfish		
September 30, 2013	Nervous System 3: Sensory Signaling and Integration	Report (Nervous 3 and Muscle)	30
October 7, 2013	Muscular System: Control of Skeletal Muscle		
October 14, 2013	Behavior: Integration of Nervous, Endocrine and Muscular Systems	Report (Behavior and Endocrine)	30
October 21, 2013	Endocrine System: Control of Glucose Concentrations In Crayfish		
October 28, 2013	Cardiovascular System 1: Electrocardiograms and Pulse	Report (Cardio 1 and 2)	30
November 4, 2013	Cardiovascular System 2: Control of Heart Rate		
November 11, 2013	Renal System: Salt and Water Balance in Humans	Report (Renal)	30
November 18, 2013	Independent Projects - Assigned Sections Only	Proposal, Data Journal, and Manuscript	100
November 25, 2013	Independent Projects - Open Lab		
December 2, 2013	Respiratory System: Lung Volumes and Partial Pressures	Abstract	15

A separate schedule indicating the deadlines for each of the above laboratory activities is available on the BIO 350 lab website at:

<https://sites.google.com/site/bio350animalphysiology/>