

# BIO 550 ADVANCED PHYSIOLOGY.

Tuesday & Thursday 9:30 AM to 10:45 AM **Spring 2026** (3 credit hours)  
Counts for Biology majors as well as **Neuroscience majors (Group 2 elective)**  
Instructor : Your favorite one – Robin Cooper

The goal of this course is to cover physiological mechanisms by which animals are adapted to survive in various environments. Comparative neurophysiology, osmoregulation, respiration, temperature regulation and tolerance, sensory reception, circulation, etc. will be covered.

Prereq: One year college chemistry, BIO 350 or equivalent (such as PGY 412), one year college physics or consent of instructor.

Students should emerge from the course with a firm understanding of: 1) An advanced understanding of the fundamental concepts of physiology; 2) how the scientific and experimental process is used to deduce these basic concepts; and 3) how organisms across the animal kingdom utilize similar and different physiological functions as fundamental adaptations to their existence within the environment.

Lectures and discussion mostly. Some days we may be able to conduct laboratory experiments during the lecture time. Reading and discussion of journal articles and chapters from a text will be the main content.

One can also use this course as an **Honors course** after course conversion approval with the Lewis Honors Program.

[illegible]

### Instructor Information

Robin L. Cooper, Ph.D.  
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Tel: 859-559-7600- cell  
Office hours: By appointment (appointments made by email only)

### Lecture Time and Location

Tues/Thurs 9:30-10:45 a.m. The traditional in-person lecture time is used to determine the officially scheduled FINAL exam date/time, lecture and lab times. Building is THM , room 109

**Text:** *Comparative Animal Physiology* by Philip C. Withers: 1992 by Brooks/Cole Publishing Co. Inc. ISBN 0-03-012487-1. (used ~12 to 20 US dollars-see amazon)

## Course Goal

The overall goal of this course is for you to gain and retain knowledge of the fundamental concepts of animal physiology which you can apply to any future endeavor in the biological sciences.

### **Minimum skill and technology requirements**

1. Computer with reliable internet access. If you do not own a personal computer or have reliable internet access, UK has several computer labs with internet access throughout campus that are available to students free of charge.
2. Familiarity with basic word processing. We will be using MS Word.
3. Familiarity with logging in and using Canvas. If you are not familiar with how Canvas works, or would like additional information, please visit the Canvas online training site at: <http://www.uky.edu/ukonline/canvas-0>.

### **Inclement Weather Policy**

Lectures are held in person every Tuesday and Thursday, in THM 109. If a lecture session cannot be held in person (e.g., instructor quarantine, campus moves to remote learning), lectures will be delivered through Zoom.

If a class session cannot be held in person lecture content maybe moved online. An announcement will be posted through Canvas with 2 hours of any disruption to a scheduled lab session.

### **Lecture Activities, Assignments and Grades**

While attending lectures is required, attendance is not taken. In person lectures will be recorded via ECHO360 (at least we will try). Graded exams will be administered in person, approximately every 4-5 weeks throughout the semester. Graded, in-person quizzes will be administered approximately halfway between exams. More details are provided below.

**Exams:** Exam dates are listed in the course schedule at the end of this syllabus. Exams will be delivered in THM 109 during the lecture period during your regularly scheduled class period or potentially even take home aspects of some exams will be given. The final exam will be delivered in THM 109, during the official final exam date/time set by the Registrar's Office. All exams consist of hard copy, multiple choice and short answer (open response) questions covering the material taught in that unit. **Physiology concepts build upon one another and therefore, all exams will be cumulative from beginning to end of the course.** In other words, concepts learned in all previous exams will be required for conceptual understanding of current exams. Regardless of time, location or date, all exams are in-person, closed-note type of exams, and completed individually. Missed exams due to unexcused absences cannot be made-up. In the event of an excused absence, documentation may be requested and will follow Senate Rules regarding excused absences and make-up assignments (noted below). Make-up exams are limited to no more than one per student per semester (20% Rule applies). Exams 1 and 2 are worth up to 120 points each. The final exam is worth up to 150 points.

**Quizzes:** Hard copy lecture quizzes will be delivered in person, during the lecture times, in a manner similar to those described above for the exams. Similar to the larger exams, hard copy

lecture quizzes will be composed of multiple choice and short answer type of question sets that are completed individually, with closed notes. Quiz assignments may include submission of short journal article reviews, which would be submitted through Canvas. Lecture quizzes are designed to help you prepare for exams. Missed quizzes due to unexcused absences cannot be made-up. In the event of an excused absence, documentation may be requested and will follow Senate Rules regarding excused absences and make-up assignments (noted below). Make-up quizzes are limited to no more than one per student per semester (20% Rule applies). Each quiz is worth **up to 15 points**. **A total of 4 quizzes will be delivered during the semester.** Maybe extra credit quizzes will be given.

### **Summary of Graded Assignments to Determine Course Grade**

#### **Lecture**

Exams during the semester (2)	2 x 120 = 240 points
Final Exam	1 x 150 = 150 points
Quizzes (4) might include an article review	15 x 4 = 60 points

**450 points possible**

Grading: Final grades will be based on total points earned and will be assigned as follows:

A = 405-450 points

B = 360-404 points

C = 315-359 points

D = 270-314 points

E = less than 269 points

### **Questions about Grades:**

If you have a concern regarding your posted score for an assignment or exam, **you have 1 week from the day the scores are posted (in Canvas) to contest that score.** After one week the score remains as posted. It is your responsibility to check your scores in a timely manner and to follow-up immediately if you have a concern. Contact Dr. Cooper for exam/quiz questions .

### **Additional Course Policies:**

**\*Note any amendments to this syllabus will be posted on Canvas or emailed and are considered course policy\***

**1. Attendance:** You are expected to attend all lab classes. Attendance is the best way to prepare for exams. **All of the material on the exams is covered in class or from the readings, power points, papers covered and discussion topics in class.** If you miss a class, it is your responsibility to get any missed information, assignments, etc. Contact other students in the course for the lecture notes. You are expected to spend a MINIMUM of 3-6 hours per week interacting with the course material OUTSIDE of the classroom.

**2. Please meet with instructor if you encounter any problems!** I am here to help you! If you are having any difficulty with the coursework, it is best to get help sooner rather than later. In addition, please let me know of any special circumstances you may have.

**3. E-mail Communication:** You are responsible for all instructions and information sent out to the class through e-mail. The anti-spam software for many e-mail accounts (g-mail, yahoo, hotmail, etc.) will not deliver mail that has been sent to multiple addresses. Announcements and class communications are sent to all students in the class and so they are often filtered into junk mail folders. Avoid missing announcements by using your UK or Gmail e-mail account. Check your email often (at least daily). Email sent to me from Yahoo and Gmail accounts is often filtered, so please send communication using your UKY email or a Gmail account that is working and one that I respond to you on.

**4. Disabilities/ Medical Conditions:** If you have a documented disability that requires academic accommodation, you must provide me with a Letter of Accommodation from the Disability Resource Center for the 2021-2022 academic year or current semester (Suite 407 Multidisciplinary Science Center. Phone: 257-2754. Email: [dtbeach1@uky.edu](mailto:dtbeach1@uky.edu)). DRC letters must be received no later after the 1st week of classes starting if testing accommodations are needed for EXAM 1.

**5. Course Policy on Classroom Civility and Decorum:** The University, College, and Department all have a commitment to respect the dignity of all and to value differences among members of our academic community. There exists the role of discussion and debate in academic discovery and the right of all to respectfully disagree from time-to-time. Students clearly have the right to take reasoned exceptions 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. Obviously, the accepted level of civility would not include attacks of a personal nature or statements denigrating another on the basis of race, sex, religion, sexual orientation, age, national/regional origin or other such irrelevant factors.

**6. \*\*\* A Note Concerning Copyrighted Class Materials (READ THIS INFORMATION CAREFULLY)**

The Instructor's lectures and course materials, including power point presentations, tests, outlines, and similar materials, are protected by copyright. You may take notes and make copies of course materials for your own use. You may not allow others to reproduce or distribute lecture notes and course materials publicly whether or not a fee is charged without the express written consent of the Course Instructor.

**7. Class Recordings/Copying Notifications**

- The University of Kentucky Student Code of Conduct defines Invasion of Privacy as using electronic or other devices to make a photographic, audio, or video

record of any person without their prior knowledge or consent when such a recording is likely to cause injury or distress.

- As addressed in the Student Code of Conduct, students are expected to follow appropriate university policies and maintain the security of linkblue accounts used to access recorded class materials. Recordings may not be reproduced, shared with those not enrolled in the class, or uploaded to other online environments.
- If the instructor or a University of Kentucky office plans any other uses for the recordings, beyond this class, students identifiable in the recordings will be notified to request consent prior to such use. In anticipation of such cases, students may be asked to complete an “authorization of use” form by a faculty member.
- Video and audio recordings by students are not permitted during the class unless the student has received prior permission from the instructor. Any sharing, distribution, and or uploading of these recordings outside of the parameters of the class is prohibited. Students with specific recording accommodations approved by the Disability Resource Center should present their official documentation to the instructor.

**8. Cheating: 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. Use of AI to complete any assignment is not allowed. There may be a lecture assignment using AI *ChatGPT* (a free-to-use AI system) as a learning tool but this will be explicitly stated when it can be used.

*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.

All lecture quizzes and exams are “closed-book”, meaning that you are not permitted to use written information in the form of notes, books, or “crib-notes” during these examinations. Behaviors considered cheating in this course include the following (this list is NOT exhaustive):

- a. Using unauthorized materials during a quiz or exam
- b. Copying from other students during a quiz or exam, or allowing someone to copy from you
- c. Communicating with other individuals during quizzes or exams
- d. Allowing someone else to complete your graded work for you (lab worksheets, quizzes assignments, exams)
- e. Having someone else bring your clicker to class and click for you in your absence
- f. Using someone else’s clicker during class to click for them in their absence
- g. Copying or paraphrasing someone else’s writing and presenting them as your own

The **minimum** penalty for these offenses is an “E” grade for the assignment. A cheating offence of any kind will result in your being reported to the Academic Ombud.

#### **Missed Deadlines and Absentee Policies and Dates:**

Make-up opportunities will only be given for **DOCUMENTED** excused absences **as defined by the University (Senate Rule V.2.4.2)**.

A missed assignment, quiz, or exam will result in a score of zero for that assignment, unless an acceptable written excuse is presented **within 1 week of the missed assignment or within 1 week of returning to class after an EXCUSED illness. THERE WILL BE NO EXCEPTIONS.** Tier 1 excuses from UK Student Health, notes from family members, friends, etc. and documentation that has been altered (dates crossed out or changed) are not acceptable forms of documentation for missed assignments. Further, we will not accept any doctor’s notes or other documentation if it is submitted more than 7 days after the date of the doctor’s note or other excused absence. I recommend that you contact me and Dr. Danley as soon as you are well enough to send an email, and within 24 hours of any missed assignment even if you do not yet have documentation. For labs especially, waiting until the last day to notify the course instructor and provide documentation may result in you being unable to make-up the missed lab, due to the nature of the labs (live animals, time-sensitive materials, etc.). **Note: Problems associated with parking, traffic, library services, family commitments (including attending weddings), travel itineraries, internet connection issues, computer crashes, procrastination, over-sleeping or forgetfulness are not acceptable excuses for missing an exam.**

Make-up exams will consist of short-answer questions and/or multiple-choice questions. **If you miss an exam, you have 2 options:**

1. You can make it up **WITHIN ONE WEEK** of the scheduled exam. Contact Dr. Cooper as soon as you are able to schedule the make-up.
2. If you are not able to make it up within one week, then you will make up the exam on the last day of classes during dead week.

Any student with **more than two** Final Exams scheduled on any one date is entitled to have the examination for the class with the **highest catalog number** rescheduled. The option to reschedule must be exercised **in writing** to the appropriate instructor **two weeks prior** to the scheduled examination.

#### Policy on determination of midterm grades

Midterms grades will be calculated based on all graded assignments, exams and quizzes

Acceptable (or not acceptable) documentation for excused absences .

Acceptable documentation for excused absences (e.g., a letter from an institution or medical provider, or published information). See SR 5.2.5.2.1. Other types of documentation may be accepted on a case-by-case basis. Note that Tier 1 excuses from UK Student Health are NOT accepted as documentation as that could just mean you went there to get a band aid or your flu shot.

See: <https://www.uky.edu/universitysenate/excused-absences>

#### Course policy for major religious holidays

Major religious holidays may be considered non-emergency, excused absences for individual students when advance notice (at least 2 weeks) along with proper documentation (note from clergy, church staff, etc.) is provided along with a written request (email). Excused absences due to major religious holidays follow make-up rules similar to any other excused absences (limit to the number and timing of make- assignment opportunities).

See the official Academic Senate Rules regarding excused absences for more information:

<https://www.uky.edu/universitysenate/excused-absences>

#### **Commonly asked questions:**

1. *Are the lecture Powerpoint slides posted somewhere?*  
Yes! Go to Canvas o check email or on our class web page.
2. *I am having a difficult time understanding the lecture material. What can I do?*  
There are several ways to improve your understanding of the material! First, you can read the recommended textbook or hand outs. You can email Dr. Cooper and set up a time to meet and discuss physiology.
3. *I believe my quiz or exam was graded incorrectly, or I have a question about the grading of my quiz or exam. Who should I contact?*  
You should email Dr. Cooper about grading of exams and quizzes. You must contact Dr. Cooper within 7 days of when he handed back the quiz or exam in class.

4. *What if I miss a lab assignment deadline and don't have an excuse? Can I complete the work late or turn-in the work late?*

No. Students that miss their official synchronized class session 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 graded assignment for credit, take a make-up quiz, or submit work late. Late or ineligible assignments submitted as a result of unexcused absences will not be accepted. Such submissions (if submitted anyways) will receive an automatic **zero points**.

5. *I've been trying to submit my assignment through Canvas but I keep getting error messages. The deadline is approaching quickly. What should I do?*

First, it is your responsibility to ensure all submissions through Canvas or email (but make sure you get a response -such as "got it" ) go through successfully. You can verify a submission was successful by clicking on the assignment link again in Canvas after uploading your work to it. If the assignment doesn't show up as submitted, you need to resubmit it. Be sure to click "submit" after uploading it. If you are unable to successfully submit your assignment through Canvas, you can email a copy of the assignment in MS Word format, to your instructor BEFORE THE DEADLINE has passed. Late submissions, including any emailed to your instructor after the deadline, will not be accepted. Failure to submit your assignments will negatively affect your points, and can negatively affect your overall course grade.

6. *I have a (medical/dental/PT etc.) interview and I will miss class. What should I do?*

First, you must contact the appropriate instructor at least 7 days in advance of the absence. If you will miss lecture only, please email Dr. Cooper.



**Class Schedule: \*Note the classroom topics are tentative and flexible\***

<b>Date</b>	<b>Classroom Topic</b>
13 Jan	Course overview; homeostasis and feedback control (Pages 14-27)
15 Jan	Course overview; homeostasis and feedback control (Pages 14-27)
20 Jan	Cellular energy (Pages 58-80)
22 Jan	Cellular energy (Pages 58-80)
27 Jan	Temperature (Pages 123-191)
29 Jan	Temperature (Pages 123-191)
3 Feb	Temperature (Pages 123-191)
5 Feb	Membrane physiology (Pages 192-252)
10 Feb	Membrane physiology (Pages 192-252)
12 Feb	Membrane physiology (Pages 192-252)
17 Feb	<b>EXAM 1</b>
19 Feb	Sensory physiology (Pages 254-238)
24 Feb	Sensory physiology (Pages 254-238)
26 Feb	Sensory physiology (Pages 254-238)
27 Feb	Muscle Physiology (Pages 415-447)
3 Mar	Muscle Physiology (Pages 415-447)
5 Mar	Muscle Physiology (Pages 415-447)
10 Mar	Primary papers
12 Mar	Primary papers
March 16-20	March 16-20-Monday through Saturday-Spring Vacation-Academic Holidays
24 Mar	Primary papers

26 Mar	TBA
31 Mar	TBA
2 Apr	TBA
7 Apr	TBA
9 Apr	TBA
14 Apr	TBA
16 Apr	TBA
21 Apr	TBA
23 Apr	TBA
28 Apr	TBA
30 Apr ?	TBA
May 5th	<b>FINAL EXAM</b> ( <a href="https://registrar.uky.edu/examination-schedules">https://registrar.uky.edu/examination-schedules</a> ) Tuesday, May 5 8:00 - 10:00 AM But we might be able to take it on an earlier day like on April 28 <sup>th</sup> .

## Spring 2026 - Important Dates