**Biology 350: Animal Physiology**
**Spring 2020**

**Instructor Information**:
Robin L. Cooper
226 TH Morgan Building
e-mail: RLCOOP1@uky.edu
Office Hours: By appointment (appointments made by email only)
Tel: 859-559-7600

**Lecture Time and Location:**
Tues/Thurs 9:30-10:45 a.m. 116 Thomas Hunt Morgan Building

**Lab Instructor**:
Melody Danley, Ph.D.: mlda227@uky.edu
Labs: 104 Jacobs Science Building (JSB)

**Lab Teaching Assistants:**
TBA

**YOU MUST ATTEND CLASS/LAB AND TAKE ALL EXAMS AND ASSIGNMENTS WITH THE SECTION IN WHICH YOU ARE OFFICIALLY REGISTERED. Credit will only be awarded for activities completed with the section in which you are officially registered.**

**Course Textbook and Materials:**
1. **Required: iClicker Reef Student Access**

**2. The textbook is not required but is RECOMMENDED:**
*Animal Physiology: From Genes to Organisms* ©2016 | Thomson & Brooks/Cole, Sherwood, Klandorf, and Yancy. Note that access to online material is not required. Older versions of the textbook (©2013) are also acceptable.

**Course Description:**
Physiology is the study of the function of living organisms. It is a vast field, ranging from studies of molecules in cells to populations of organisms. By comparing diverse physiological adaptations of organisms to their specific environments, we learn about fundamental physiological principles.

The laboratory component of the course is a **major** portion of the fundamental learning of all concepts in Animal Physiology. The course has been designed so that the lab and classroom material are closely aligned. *The lab sessions are not a separate part of the course*; rather they are an essential component for the learning and application of classroom concepts.

**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.

**Course Objectives**:
Students should emerge from the course with a firm foundation in:

1. Understanding the fundamental principles of animal physiology.
2. How the scientific and experimental processes are used to develop fundamental physiological knowledge about animal functions.
3. Understanding how organisms across the animal kingdom utilize similar and different physiological functions as adaptations to exist in their environment.
4. Conducting laboratory experiments (collect data, analyze data, write up the results and interpretation) on living organisms.

**Course Learning Outcomes:**

1. Describe the anatomy & physiology of the major systems of the body within the framework of the underlying principle of homeostasis.
2. Describe and identify the variations in form and function between certain animal species.
3. Demonstrate skills in animal handling and experimentation.
4. Derive a testable hypothesis and a reasonable experimental design that will directly test that hypothesis.
5. Demonstrate skills in scientific report writing.

**Evaluation:**

**Lecture**

| | |
|---|---|
| Exams during the semester (2) | 2 x 100 = 200 points |
| Final Exam | 1 x 150 = 150 points |
| Quizzes (3) | 3 x 20 = 60 points |
| Participation (clicker questions) | 54 points |

**Lab**

| | |
|---|---|
| Lab quizzes (7 online + 1 in-person) | 8 x 2 = 16 points |
| Lab worksheets (8) | 8 x 20 = 160 points |
| Lab practical exams (1 midterm, 1 final) | 2 x 30 = 60 points |

**700 points possible**

Grading: Final grades will be based on total points earned and will be assigned as follows:
A = 630-700 points
B = 560-629 points
C = 490-559 points
D = 420-489 points
E = less than 420 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/clicker questions or Dr. Danley for laboratory-related questions

**Grading Criteria for Lecture Components:**

*Exams:* Exam dates *are listed*. Exams will be given during class or during lab time (except final exam). You will take the exam in 116 THM or in another room (room numbers will be assigned in lecture). All exams consist of multiple choice and short answer (open response) questions covering the material taught in that unit.

**Physiology concepts build upon one another and therefore, <u>all exams will be cumulative from beginning to end of the course</u>.** In other words, concepts learned in all previous exams will be required for conceptual understanding of current exams.

*<u>Quizzes:</u>* Quizzes will be given in class as a group (edit 2/12/2020-A group means me you) prior to each exam. They are meant to help you prepare for exams. You must be present with your group (edit 2/12/2020-A group means me you) to receive credit for the quiz. If you must miss class that day because of an excused absence you can make up an alternate quiz within 1 week. The 3 quizzes are scheduled.

*<u>Participation:</u>* Each class session, you will answer one or more "clicker" questions. Clicker questions will be used to determine your participation grade. **YOU MUST ATTEND CLASS TO EARN CLICKER POINTS.** You will receive credit if you submit *an answer*. *Your answer does not have to be correct to earn participation points*. You can earn up to 54 points from clicker questions, but at least 64 points will be offered. ***There is no way to make up participation points if you miss class for an unexcused absence or if you forget your clicker or if your clicker is malfunctioning*;** however, you can miss up to 10% of participation points (excused or unexcused) and still earn full credit for participation in this course. If you have an excused absence, contact Dr. Cooper to make up clicker points. **<u>I will begin collecting points for clicker questions on January 23.</u> See pages below for information about how to set up your Reef account and how to link it to BIO350.**

**<u>Grading Criteria for Lab Components:</u>**
There are 8 lab activities which must be completed as part of the course. For each lab activity, there is a quiz and a lab worksheet to be completed for points. The lab procedures (protocol), a data collection sheet, and additional resources will be provided. All written lab materials are made available through Canvas. There is no separate lab manual to purchase. You are responsible for printing out your own hard copies or accessing electronic copies of the written lab materials to use during each laboratory period. Hard copies will not be provided.

*<u>Lab Quizzes</u>*: Success and learning during the lab requires advance preparation. Therefore, students are REQUIRED to read the lab protocol before the lab and complete the online lab quiz before each lab activity. Each quiz opens five days before the regularly scheduled lab session. <u>Each lab quiz must **BE COMPLETED ONLINE by 11:59 PM THE NIGHT BEFORE THE LAB.**</u> For example, Monday lab sections, the deadline is Sunday evening each week. For Wednesday lab sections, the deadline is Tuesday evening. Familiarity with the concepts and technical details of the lab protocol will be assessed by the lab quizzes. Lab quizzes are worth 2 points each and can be taken twice.

*<u>Lab Worksheets</u>*: Students will complete a lab worksheet for each lab session. Only students that are present during the entire lab session are eligible for the worksheet points. Lab worksheets typically identify basic experimental design elements, describe the results, and interpret the data associated with that week's lab activity**. Lab worksheets are due as determined by the TA and Dr. Danley for each lab section**. Lab worksheets are worth 10 points each (8 labs x 20 points = 160 points total).

**<u>Typical lab schedule:</u>**
1. Pre-lab quiz – Complete by 11:59pm the night before lab
2. Beginning of lab: Attendance taken, followed by a brief introduction of lab by the TA
3. Middle of lab: Perform experiments
4. End of lab: Data analysis

Lab attendance: At the start of each lab, the TA will take attendance. Students that are more than 10 minutes late to lab will be counted as late. Students marked late 3 or more times will be asked to provide written documentation excusing the tardy. Students that show up to lab more than 15 minutes late, or have an excessive number of late, unexcused arrivals may be counted as absent (unexcused). Students marked absent from lab are not eligible to submit the lab worksheet for points. Unexcused absences cannot be made-up.

Most labs will run the full 2 hours and 50 minutes. You must stay until all work is completed. Leaving early and asking your lab partner to complete the work for you is not acceptable. Students caught leaving before all work is completed will be marked absent and will be awarded 0 points on the associated lab worksheets.

**Course Policies:**

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

**1. Attendance:** You are expected to attend all classes. Attendance is the best way to prepare for exams. **All of the material on the exams is covered in class. Students will interact with each other to solve clicker problems. You must be present to benefit from this active learning.** 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. Participation credit will only be awarded for clicker questions completed during course time by students that are present in class.

**2. Please meet with me 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. Exams:** Exams will take place during the normally scheduled class time or a lab section time on the dates in this syllabus. Documentation of a university-approved excused absence is required to make up a missed exam. Please see the *Exam Policies and Dates* section for more information.

**4. 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 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 account.

**5. Disabilities/ Medical Conditions:** If you have a documented disability that requires academic accommodations, you must provide me with a Letter of Accommodation from the Disability Resource Center for the 2018-2019 academic year (Suite 407 Multidisciplinary Science Center. Phone: 257-2754. Email: dtbeach1@uky.edu). DRC letters must be received no later than Friday, September 13th if testing accommodations are needed for EXAM 1.

**6. 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 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. 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.

**7. *** 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.

**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.

**All students will take an online (on Canvas) quiz about plagiarism.** This is a required quiz about plagiarism to help prepare you for the scientific writing you'll be completing in the BIO 350 course. A plagiarism hand-out is available on Canvas --> Files --> Scientific Writing folder for reference. **Each student must repeat the quiz until s/he receives a 9/9 (100%)**. **A student will not be permitted to participate in the lab if this plagiarism quiz is not completed** (and will count as an unexcused absence). There are no course points associated with this quiz. Points associated with this quiz are used solely to show that a student has completed the quiz with a 9/9 score. These quizzes are not applied to the student's overall course grade.

*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 tests 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 students during quizzes or exams
d. Allowing someone else to do your written work (lab worksheets, GCCR assignments)

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.

9) **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.

**ALLERGY/HEALTH WARNINGS:** We use live crayfish for several of the laboratory exercises in BIO 350. If you have a known allergy to shellfish, then you will also be allergic to the crayfish. Please notify Dr. Danley to discuss how to best complete the lab exercises with minimal exposure to the crayfish.

Skin sensitivities: Due to the increasing sensitivities to latex, we use only nitrile gloves in this lab. However, the electrode patches used during the ECG lab have been known to cause mile allergic reactions to individuals with latex or silver allergies. If you are allergic to latex or silver, please notify Dr. Danley to discuss how to best complete the lab exercises with minimal exposure.

**Every student is required to complete an online lab safety training course before the first lab session. At the end of the course is a test. To receive credit for the online training, you must receive 100% on the test. It is an easy test and you can take it multiple times until you get a 100 %. The training can be used on your resume as professional development training as well. The website for the safety test is: http://ehs.uky.edu**

**Exam Policies and Dates:**
Bring your UKY ID and a pencil to each exam. Make-up exams (for missed examinations) will only be given for **DOCUMENTED** excused absences **as defined by the University (Senate Rule V.2.4.2)**

A missed exam will result in a score of zero for that exam, unless an acceptable written excuse is presented **within 1 week of the missed examination or within 1 week of returning to class after an EXCUSED illness**. THERE WILL BE NO EXCEPTIONS. 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. **Note: Problems associated with parking, traffic, library services, family commitments (including attending weddings), travel itineraries, procrastination, over-sleeping or forgetfulness are not acceptable excuses for missing an**

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. Pendergast 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.

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.

**Long-term Excused Absence:**

If you have an excused absence that causes you to miss EITHER 2 labs or 20% of the points in the course, then you will need to either withdraw from the course. Please contact Dr. Cooper and Dr. Danley if you have a long-term excused absence.

**iClicker Reef is required for the course and you should be prepared to click during every lecture:**

We will be using a cloud-based student response software by iClicker in class. When clicking in, you must be present in class and are not permitted to send responses from outside of the classroom.

*Creating Your iClicker Reef Student Account*

You will need to create an iClicker Reef Student account to participate in class using your laptop, smart phone, or tablet connected to the university Wi-Fi. Go to iclicker.com/students or download the iClicker Reef Student app for your Apple or Android device to sign up for a Reef account. Use your university email address and your student ID. You can edit your email address, password, or student ID from your account profile. Do ***not*** create and use more than one Reef account as you will only receive credit from a single account.

You can purchase a subscription to use Reef online with a credit card or you can complete an in-app purchase. When you create your Reef account, you will have a free two-week trial subscription.

*Add This Course to Your Reef Account*

Search with the following information to find this course and add it to your Reef account:

Institution: University of Kentucky

Course: Bio 350

*Connecting Your Points to the Learning Management System (LMS)*

In order for your account to be associated with BIO350, you must click on the iClicker/Reef course link within Canvas. You can complete this process by following the instructions below:

Log into Canvas.

Go to BIO350 course page.

Locate the iClicker Reef registration link under "Modules" and click on it.

Sign into your Reef account from the window that opens.*

*If you don't already have a Reef account, you should create a new account. However, do not create a second account as it will cause issues for both you and your instructor.

**All steps described above (creating a Reef account, registering your account with BIO350, and linking your account with Canvas) must be completed by 5pm on January 23rd.** It is your responsibility to complete these

steps, including troubleshooting, by this date. ***If you forget your device for clicking in, or your device is not working properly, you will not receive participation points that day*.** Remember, though, that you can earn full attendance points if you successfully click in on at least 90% of questions.

*Troubleshooting*
You can find the answers to many of your questions on the iClicker student support site https://community.macmillan.com/community/iclicker-support/iclicker-student-support). If you continue to experience issues, please contact support via phone (866.209.5698 ) or email (support@iclicker.com). Live support is available Monday - Thursday from 9AM - 11PM, ET and Friday from 9AM - 9PM, ET

**Commonly asked questions:**

1. *Are the lecture Powerpoint slides posted on Canvas?*
   Yes! Go to Canvas, to Files, and then choose the lecture file.

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. You can either purchase the textbook (there are low-cost online options in addition to the hard copy textbook) or you can "check out" Dr. Cooper's textbook. Second, you can go to the Biology Learning Center. Check the schedule to make sure that you attend when a BIO 350 student tutor is available. Third, 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 she handed back exams in class.

4. *I believe my lab worksheet or scientific writing assignments were graded incorrectly. Who should I contact?*
   First, you should contact the primary TA for your lab section within 7 days of receiving your grade. The primary TA grades your lab worksheets and assignments, so they will be best suited to answer your questions.

5. *I have already spoke to my TA about my lab assignment, but I would still like it to be regraded. Who should I contact?*
   You should email Dr. Danley. Dr. Danley handles all lab regrade requests but only after the student has first met with their lab TA. If you have not met with your lab TA prior to contacting Dr. Danley, you will be directed back to your TA.

6. *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 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 graded assignment for

credit, take a make-up quiz, or submit work late. Furthermore, students that are absent from lab are not eligible to receive points for any worksheets based on the in-lab work. 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**.

7. *What if I have a documented excuse for missing lab? What should I do?*
   **First, send Dr. Danley an email.** Dr. Danley coordinates all make-up lab sessions. Be prepared to provide documentation for your absence. For lab related non-emergency absences, you must notify Dr. Danley at least 7 days in advance of the absence. For emergency-related absences, you must notify Dr. Danley no later than 48 hours after the missed lab. Acceptable documentation must be submitted no later than 3 days after the missed lab. Excused, missed work must be completed within one week (7 days) of the original scheduled due date, unless other arrangements have been made with the TA/instructor. 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.

8. *Where do I turn in my lab assignments?*
   All lab assignments must be submitted online through the appropriate link on Canvas on the ***Assignments*** page. A separate link will be made available for each assignment due. After the deadline for the assignment has passed, the link is automatically deactivated, and is no longer available.

9. *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 go through successfully. You can verify a submission was successful by clicking on your uploaded file after uploading 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 TA <u>BEFORE</u> THE DEADLINE has passed. Late submissions, including any emailed to your TA after the deadline, will not be accepted. Failure to submit your lab assignments will negatively affect your lab points, and can negatively affect your overall course grade.

10. *What if I am running late to lab, can I come in late and still do the lab?*
    It depends. If you arrive after the TA has already taken attendance, but before the lab exercise is started, you will be marked late and may be permitted to complete the lab exercise for credit if you have no more than 2 late arrivals, total, for the semester). If you arrive after the lab activity is already underway and you do not have a valid and documented excuse, you will not be permitted to complete the lab, you will be marked absent, and you will not be eligible to complete the associated lab worksheet for credit. If you arrive after the lab is underway, with documentation, you may be asked to complete a make-up lab instead (at the TA's discretion). Students with excessive, unexcused late arrivals that have been marked absent will not be permitted to complete the lab activity for credit.

11. *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. If you will miss lab, please email Dr. Danley to set up a make-up lab.

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

| Date | Classroom Topic | Lab |
|---|---|---|
| 16 Jan | Course overview; homeostasis and feedback control | No Lab; Complete online lab safety training |
| 21 Jan | What is plagiarism? Cellular energy | No Lab; Complete online lab safety training |
| 23 Jan | Membrane physiology | |
| 28 Jan | Communication along and between neurons | |
| 30 Jan | Communication along and between neurons | Lab 1: Homeostasis Lab |
| 4 Feb | Synaptic integration & the NMJ | Lab 2: Resting Membrane Potentials in Crayfish |
| 6 Feb | Synaptic integration & the NMJ | |
| 11 Feb | Nervous systems | Lab 3: Compound Action Potentials (CAP) in Grass Frogs |
| 13 Feb | Sensory physiology; **QUIZ 1** | |
| 18 Feb | Sensory physiology | NO lab |
| 20 Feb | **EXAM 1** | |
| 25 Feb | Muscle physiology | Lab 4: Skeletal Muscle Properties in Grass Frogs |
| 27 Feb | Muscle physiology | |
| 3 Mar | Cardiovascular physiology | **Lab practical #1 Exam** |
| 5 Mar | Cardiovascular physiology | |
| 10 Mar | Cardiovascular physiology | Lab 5: Cardiovascular physiology in frogs |
| 12 Mar | Endocrine systems, **Quiz 2** | |
| 17 Mar | Spring break | NO lab |
| 19 Mar | Spring break | NO lab |

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| 24 Mar | Endocrine systems | Lab 6: Electrocardiograms in College Students |
| 26 Mar | Endocrine systems | |
| 31 Mar | **EXAM 2** | No lab |
| 2 Apr | Respiration | |
| 7 Apr | Respiration | Lab 7: Respiration in College Students |
| 9 Apr | Excretion, fluid and ionic/osmotic balance | |
| 14 Apr | Excretion, fluid and ionic/osmotic balance | Lab 8: Water and Salt Balance in College Students |
| 16 Apr | Excretion, fluid and ionic/osmotic balance | |
| 21 Apr | Acid-base balance | **Lab Practical #2 Exam** |
| 23 Apr | Digestion, **QUIZ 3** | |
| 28 Apr | Digestion | No lab |
| 30 Apr | Reproduction/thermal regulation; | |
| May 6 | **FINAL EXAM** 10:30am-12:30pm | No lab |