

# PCB4723C: Physiology and Molecular Biology of Animals

Spring 2021

## COURSE OVERVIEW AND OBJECTIVES

In this course, you will learn physiology at the molecular, cellular, tissue, and systemic levels, emphasizing application of concepts and analysis of information over recalling of facts. The course is not a survey of how different animals function; it is an in-depth exploration of unifying principles that are broadly applicable to animals including humans. This approach is well-suited for students preparing to enter health professional schools (e.g., pre-med, pre-vet, pre-dental) and graduate school. Enrollment for this class is 5 credit hours.

The ‘discussion/lab’ portion of the course will utilize discussions, physiological simulators, an exercise, problem sets, and team projects to reinforce principles discussed in lectures, promote problem-based learning, introduce students to primary scientific literature, and give students experience working in teams and communicating scientific information. These skills are useful for any career involving critical thinking.

Recommended (but not required) prerequisites: General biology (BSC 2010&2011), general chemistry (CHM 2046/2046L), and general physics (either PHY 2048/2048L or PHY 2053/2053L), all with a grade of at least C. Genetics, cell biology, and biochemistry are also recommended.

**How this will work this semester:** This course consists of two sections, an online and a face-to-face, which are *simultaneous*, i.e., they occur at the same meeting days and times. This means that some students in our class, and the instructor, will be participating from the assigned classroom, while others will be participating remotely (e.g., via Zoom) from their preferred location. On Tuesdays and during labs, face-to-face students may attend lecture in-person or online (please let your instructor know if you will be attending online), and on Thursdays everyone will attend lecture online, meeting the >51% in-person instruction.

As this is a new format for us, we want to ensure that you are aware of the following:

- For the face-to-face sections: This course has been assigned a physical classroom with enough capacity to maintain physical distancing (6 feet between individuals) requirements. Please utilize designated seats and maintain appropriate spacing between students. Please do not move desks or stations. Since our rooms hold significantly fewer students than normal, the number of students *in* the classroom will be quite small – in this section, there will be 23 students in person, with the remaining 125 participating online.
- In-person students (and faculty) are required to wear approved face coverings at all times during class and within buildings, and to maintain physical distancing of at least six feet at all times. Following and enforcing these policies and requirements are all of our responsibility. Failure to do so will lead to a report to the Office of Student Conduct and Conflict Resolution.
- Face-to-face students and instructors are expected to clean their spaces (desks, chairs, podium) at the end of every class period. Sanitizing supplies are available in the classroom.

- Technology in the classrooms has been updated, but is still insufficient to allow communication between face-to-face and virtual students. The instructor will be the only one able to communicate with both populations, but will have to do so while remaining behind the podium (due to microphone placement). The instructor will have to repeat any questions or comments from face-to-face students for the benefit of the virtual students.
- If face-to-face students wish to join the Zoom call from the classroom, they will have to provide their own computers and, crucially, headsets, in order to avoid interference from the various microphones. Face-to-face students are also allowed and **encouraged** to attend lecture online if desired.
- Instructors will make every effort to incorporate both cohorts of students simultaneously, although this will require a lot of trial and error and a great deal of patience on all our parts.

This will be a different experience for all of us, but we are doing our best to comply with university mandates while still fulfilling the goals and objectives of our courses and providing you with the best possible educational experience. We appreciate your understanding.

## **INSTRUCTORS**

### **Lecturer**

Connie Rich, PhD, office hours Tuesday 11-12 and Wednesdays 9-10 on Zoom. Office hours will be extended leading up to each exam. *Contact is by Canvas mail.*

### **Teaching Assistants**

Undergraduate Teaching Assistants (lecture): TBA

Undergraduate Teaching Assistants (lab): Vincent Archibald ([varchibald@ufl.edu](mailto:varchibald@ufl.edu)) and Rainer Rodriguez ([rainerrodriguez@ufl.edu](mailto:rainerrodriguez@ufl.edu))

Graduate TAs (discussion sessions): Mitch Walters ([mjw246@ufl.edu](mailto:mjw246@ufl.edu)), Ella Nicklin ([e.nicklin@ufl.edu](mailto:e.nicklin@ufl.edu))

## **REQUIRED/RECOMMENDED COURSE MATERIALS**

RECOMMENDED: Animal Physiology: from genes to organisms, 2<sup>nd</sup> Edition by Sherwood, Klandorf, and Yancey, Brooks/Cole 2013. This version has an owl on the cover. Options for access are:

- Buy new or used Hardcover ~\$100-250: From Cengage, Amazon, UF others...
- Rent Hardcover ~\$20 From Amazon
- First Edition (2004) \$3 and up. From Amazon, Textbooks.com, others... Note – The instructor has not seen the first edition. Use this option at your own risk.
- Search Google/shopping for more options

**REQUIRED:** We will heavily use the Top Hat Monocle instant response system in class to help stimulate understanding and discussions. Details on the system and how to register are at: <https://tophat.com/> (join code 444616)

You can purchase TopHat access for \$48 for the year or \$35 for the semester (may be discounted for Spring 2021).

Calculator – any scientific calculator should be sufficient, and you will have access to a scientific calculator during exams on Honorlock.

## DISCUSSIONS & EXERCISES

In addition to lecture, you will participate in a mixture of discussions, computer-based physiology simulations, and an exercise. Details are in the Discussions/Lab syllabus in Canvas/Files. A portion of exams 2, 3, and 4 will be related to papers you discuss as groups. For online sections, you will still be expected to attend labs on Zoom according to the schedule.

## GRADING

Exam 1	100
Exam 2	100
Exam 3	100
Exam 4	100
Quizzes	80
In class response questions	100
Simulations and exercises	**40
Problem sets	**30
<u>Literature presentation and participation</u>	<u>**50</u>
Total	700

**Exams** will test your understanding and application of concepts presented in lecture, in study questions, and in the discussion sessions. There will be many “connect the dots” questions and few based on regurgitation of material. Exams will be held on Honorlock- student guidance can be found [here](#).

**Quizzes** will be held in the last 30 minutes of class on Thursday most weeks (see schedule), and they will be open-note, open-book, and collaborative. You should **not** use Google- these quizzes will be an extra form of studying through questions that will be challenging enough to facilitate conversation and debate with your classmates. This will greatly aid your understanding; Googling will not. There will be 10 quizzes and your lowest 2 will be dropped, so no make-ups will be offered. *It is YOUR responsibility to budget these for illnesses, post-graduate school interviews, university sanctioned events, religious holidays, sleeping-in, etc...*

**Classroom Response System:** We will be using TopHat, where questions will be available from 8am until 11:59pm on the day of lecture. The total number of in class response questions will not be known until the end of the course, and your total clicker points earned will be calculated as a percentage of 100 points. You can drop 1/4th of your incorrect and missing response questions.

*It is YOUR responsibility to budget these for illnesses, post-graduate school interviews, university sanctioned events, religious holidays, sleeping-in, dead batteries, etc...*

**Extra Credit:** At the discretion of the instructor, up to 2% of extra credit will be available. However, any other requests for extra credit will not be accepted and will be met with annoyance.

\*\*Discussion points will be covered by your graduate teaching assistants.

## GRADING SCALE

low	high	letter
90.00	100.00	A
85.00	89.99	B+
80.00	84.99	B
75.00	79.99	C+
70.00	74.99	C
65.00	69.99	D+
61.00	64.99	D
0	60.99	E

At the end of the course, grade ranges may or may not be curved up, but they will not be curved down. For example, if you earn 80.00% of all possible points then you guaranteed a B grade.

However, once final grades are set, cut-offs will be strictly enforced, i.e. an 89.99 is a B+ and will not rounded up to an A.

Due to the fact that the world is royally screwed up right now, this semester I have gotten rid of all “-“ designations, but kept “+” designations.

## FACE-TO-FACE STUDENTS

Students enrolled in the face-to-face sections will be expected to meet current university guidelines, including but not limited to: masks at all times, distancing of at least 6 feet from all other individuals, and up-to-date COVID tests (currently in-person students will be tested at least every 2 weeks). There will be absolutely NO exceptions. If students come into class who are not cleared to be on campus or who fail to abide by health and safety measures set out by the CDC and UF, students will receive penalties. As a physiology instructor and as a human in this day and age, I take this pandemic very seriously and my attitude regarding this issue reflects that. If you are feeling AT ALL unwell or if you have come into contact with someone sick, please attend the class virtually as instruction will be given to the exact same degree.

Further information is located here: <https://policy.ufl.edu/policy/student-behavioral-expectations-in-response-to-covid-19/>

## TENTATIVE COURSE OUTLINE

Approx. Week	#	Topics	Reading*
1/11	1	1-Homeostasis & Integration; 2-Cell & Molecular Physiology;	Chap. 1, 2, 3
1/18	2	2-Cell & Molecular Physiology; 3-Metabolism	Chap. 2, 3
1/25	3	4-Approaches to Physiology	Chap. 15
2/1	4	Catch-up & Review; <b>Exam 1</b>	
2/8	5	5-Transport of solutes and water	Chap. 3
2/15	6	6-Salt and water physiology; 7-Urine dilution	Chap. 13, 12
2/22	7	7-Urine dilution; 8-Urine concentration	Chap. 12, 7, 13
3/1	8	Catch-up & Review; <b>Exam 2</b>	
3/8	9	9-Membrane potentials; 10-Neurons	Chap. 3, 4
3/15	10	11 -Synapses	Chap. 5
3/22	11	12-Nervous Systems; Catch-up and Review	
3/29	12	<b>Exam 3</b> ; 13- Endocrine control and stress	Chap. 7
4/5	14	14-Muscle physiology; 15-Cardiovascular physiology	Chap. 8
4/12	13	15-Cardiovascular physiology; Catch-up & Review	Chap. 9
4/19	15	<b>Exam 4</b>	

\*Note that chapters are listed only as a rough guide; we will not cover all sections or material in each chapter. Only material covered in class will be covered on the exams.

Tentative exam dates: Exam 1- 2/4; Exam 2- 3/4; Exam 3- 3/30; Exam 4- 4/20 (not cumulative).

## **SUGGESTED STUDY METHODS**

### **Attend class and participate**

There is tremendous variation in how people learn and in the foundation they have upon entering this course. However, one thing that is certain is that you will **not** do well if you do not participate. This can be difficult in a virtual format, but we will make it work and I will walk you through how to do well! It is important that you put in the work- seniors have failed this class and had to put off graduation. Some of them had GPAs above 3.5 and were already conditionally accepted to medical or dental schools. They decided they would miss class and get through by cramming for exams. *They were wrong and it cost them.* You will need to **participate** in the class and work hard to do well.

### **Answer and understand the concepts behind the TopHat and study questions**

There is an immense amount of material that is covered. To help provide focus, study questions will be posted for each exam in addition to the TopHat questions presented in each lecture. Exams will be limited to these concepts and material. Work on these questions as we progress. Compare your answers with those of other students, ask Dr. Rich and the undergraduate TAs for guidance, and share answers and uncertainties with other students on the discussion. Dr. Rich will not post complete answers to these questions, as the best way to learn is to discover the answer yourself. *However, the TAs and I are always happy to help YOU come to the correct answers or CONFIRM if you are correct.*

## **Participate in discussion boards and chats**

There are around 100 other students in the class trying to learn the same material. I recommend that you utilize the discussion boards on Canvas. I also encourage you to find study groups in the class. Teaching other students is a great way to make sure you know the material. Undergraduate TAs and the instructor will monitor and direct the discussions as necessary. *These are read by all students and instructors, so make sure your comments are appropriate and respectful.*

## **Keep up with material**

This is likely to be one of the most conceptually difficult courses you will take. It also has the potential to be one of the most stimulating and rewarding. You will be required to build on what you have learned in other courses and to **apply** concepts as opposed to memorizing facts.

Physiology is where you actually get to apply what you learned in courses like algebra, physics, chemistry, biochemistry, and cell biology.

You will need to be able to interpret graphs, calculate quantitative physiological variables, and integrate multiple physiological systems to understand and predict outcomes. This will require you to learn incrementally and build on concepts as they are learned. Everyone learns differently, but the best advice I can give you is to stay current on the notes, study questions, reading, and synthesis of material. And importantly- ask if you have questions!

## **Visit the undergraduate TAs or Dr. Rich**

There are 3 undergraduate TAs for this course who hold regular office hours. They did very well in this course just last semester. Dr. Rich is also happy to answer questions in office hours and over email.

## **How much time should I be spending?**

The minimum full-time work week in the US is 40 h. Most professionals work far more hours (e.g., 55-70), but let's use 40 h/week as a minimum. If you are taking 15 credit hours, then this course is 1/3 of your course load. So, that's  $1/3 \times 40 \text{ h} = 13.33 \text{ h}$  you should spend on this course.  $13.33 - 4 \text{ h lecture} - 3 \text{ h lab} = 6.33 \text{ h}$  you should spend outside of class each week or about **1.5 h per day for 4 days per week**. If you are spending significantly more time than that, talk to Dr. Rich or the undergraduate TAs to discuss how to optimize your study methods. If you are spending less, it is unlikely you will be able to gain a deep enough understanding of the material to do well.

## **OTHER POLICIES**

### **Fun for Spring 2021...**

Our class sessions [and office hours] may be audio-visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. [These recordings will only be posted through Canvas.] Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate verbally are agreeing to have their voices recorded.

If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows

students to type questions and comments live. The chat will not be recorded or shared, so please know that you are still highly encouraged to participate in the class!

As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

### **Students with Special Needs**

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center (DRC) by visiting the [Get Started page](#). It is important for students to share their accommodation letter with their instructor and discuss their access needs as early as possible in the semester. It is the student's responsibility to notify the instructor of any accommodation requests. I am happy to help throughout the semester and will work to accommodate as much as possible.

### **Communication with Dr. Rich**

Written communication should be made in Canvas (e.g., mail and announcements) or messenger pigeon unless there is an emergency. If a student fails to check Canvas, the instructor is not responsible for missed information. Grades will only be made available via Canvas. If you email Dr. Rich directly, please include your course code.

### **Academic Honesty**

All students are expected to hold themselves to a high standard of academic honesty.

Of course, you must work alone on all exam questions. Cheating will not be tolerated and will result in an automatic fail of the assignment and reporting to the Dean of Students' Office Student Conduct Committee. This is likely to result in you failing the class.

If you witness any instances of academic dishonesty in this class, please notify the instructor or contact the Student Honor Court (392-1631) or Cheating Hotline (392-6999). Helping others cheat or allowing them to cheat only hurts your grade by preventing any curve. For additional information on Academic Honesty, please refer to the University of Florida Academic Honesty Guidelines at: <http://www.dso.ufl.edu/judicial/procedures/academicguide.html>.

### **Grading discrepancies**

Concerns regarding the accuracy of graded assignments (discussions and lecture) will only be taken into consideration if the respective instructor has been notified **within 3 working days** after the assignment grade is posted.

### **Attendance and Absences**

If you must miss an exam due to an allowable scheduled absence (for example, to participate in a sanctioned university function- why are those still happening??), you must notify the instructor as soon as the event is scheduled or during the first week of classes. If you miss an exam or discussion due to an allowable but unscheduled absence (e.g., illness), you must contact the instructor as soon as possible. In the case of illness, you must provide a signed note from your primary care provider indicating that you were *unable to take the exam* on the day(s) in question to the Dean of Students' Office; it is not sufficient for the note to simply indicate that you were seen in a clinic on a given day.

## UF counseling Services

Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include: 1) UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services. 2) Career Resource Center, Reitz Union, 392-1601, career and job search services. Many students experience test anxiety and other stress related problems. “A Self Help Guide for Students” is available through the Counseling Center (301 Peabody Hall, 392-1575) and at their web site: <http://www.counsel.ufl.edu/>.

Your well-being is important to the University of Florida and to me. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu) so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1. Please remember they are there for you.

### A final note...

Well done on making it through the syllabus! You're off to a great start! As a final thought, I want you all to know that I am here for you guys and want you all to do well in this class. My aim is to arm you with knowledge, study techniques, and critical thinking skills for wherever you go from here. I also know that this semester may a tough one, as was the last one... and the one before that... So, if you are unhappy or stressed or overwhelmed or just needing some extra support, please come and talk to me or talk to someone at UF's Counseling and Wellness Center. Our job is to teach you, support you, and help you grow, and without you we couldn't do what we love.

