

# ZOO3713C: Functional Vertebrate Anatomy

Spring 2025

**Instructor: Dr. Gareth Fraser**

## COURSE OVERVIEW AND OBJECTIVES

A thorough understanding of **vertebrate anatomy** is essential for appreciation of many fields of biology, including developmental biology, molecular/ cellular biology, paleontology, evolutionary development, biomechanics, sports therapy, medicine and veterinary medicine. This course presents a functional perspective of comparative vertebrate anatomy, taking advantage of both the diversity and conservation of morphological structure in the animal kingdom to increase appreciation for how form can dictate function of select organ systems and of the organism as a whole. Form is studied not only at the anatomical level but also at the developmental level and the cellular/ molecular level as these are the basic building blocks on which anatomy is molded. We will approach this course as a tour through the chordate lineage, from tunicates to mammals, from development to adulthood.

Three weekly lectures (MWF) and the once-weekly laboratories are intended to be primarily coordinated such that the laboratory work solidifies and expands upon what is discussed in the lectures and reinforces anatomical terminology, structure and form. The systems covered include most of the major components of the vertebrate body and the understanding of these systems is achieved by lectures, dissection, examinations of prepared tissues, histological studies and practical work.

We will be occasionally supplementing practical (labs) teaching of anatomy with the use of Micro-CT (Computed Tomography) scanned vertebrates, 3D segmentation, and 'SketchFab' hosted content (in collaboration with Dr. David Blackburn; Florida Museum of Natural History), with open access to all students of Functional Vertebrate Anatomy.

**Course requirements:** Attendance to labs will be mandatory and attendance to lectures is expected. Components of the grade will be reflected in this. You will be expected to participate in exams, quizzes, and an essay. You will do the best on all of these if you participate fully in both lecture and lab!

## INSTRUCTORS

### Instructor

**Dr. Gareth Fraser**, <https://biology.ufl.edu/gareth-fraser/>  
<https://www.fraser-lab.net/>

Office hours Thursdays 10am-12pm in person. Office hours will be extended leading up to each exam. *Contact is by Canvas mail.*

### Teaching Assistants

Graduate TAs (labs) **Wesley Dillard** ([wdillard@ufl.edu](mailto:wdillard@ufl.edu)) and **Oscar Mendez** ([omendez1@ufl.edu](mailto:omendez1@ufl.edu))

## Required/recommended course materials

**(Strongly) recommended text (lecture):** Vertebrates: Comparative Anatomy, Function, Evolution 7/8th Edition. Kardong, K. Publisher: McGraw Hill

**Required text (lab):** Kardong, K.V. and Zalisko, E.J. 2014. Comparative Vertebrate Anatomy – A laboratory dissection guide 7<sup>th</sup> Edition (or earlier editions are available online used book stores) – print outs will be provided in lab.

**Required equipment:** Blunt forceps, blunt probe, sharp probe, scissors, scalpel, gloves (provided)

Optional equipment: Lab coats, apron, colored pencils (not provided)

**Required software:** We will heavily use the TopHat 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 **provided in class**).

## GRADING

Exam 1	200
Exam 2	200
Exam 3	200
Essay	100
In class response questions	200
<u>Lab</u>	<u>300</u>
Total	1200

**Exams** will be held in person during lecture time; any changes in policy will be communicated as they occur.

**Classroom Response System:** We will be using TopHat (join code **provided in class**), 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 points earned will be calculated as a percentage of 100 points. You can drop 1/4th of your incorrect and missing response questions. *There are no makeups for TopHat 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.

## Grading scale

low	high	letter
93.33	100.00	A
90.00	93.32	A-
86.66	89.99	B+
83.33	86.65	B
80.00	83.32	B-
76.66	79.99	C+
70.00	76.65	C
66.66	69.99	D+
63.33	66.65	D
60.00	63.32	D-
0	59.99	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.

## TENTATIVE COURSE OUTLINE - LECTURE

Approx. Week	#	Topics	Reading
1/13	1	Introduction; Evolution; Integumentary System	Chap. 1, 2, 3
1/20	2	Integumentary System; Development	Chap. 6, 5
1/27	3	Development; Evo Devo	Chap. 5, 7, 8
2/3	4	Cranial Skeleton; Axial Skeleton; Appendicular Skeleton	Chap. 7, 8
2/10	5	Evolution of Limbs; Connective Tissue; Review	Chap. 9
2/17	6	<b>Exam</b> ; Muscles	Chap. 10
2/24	7	Muscle Evolution; Digestive System	Chap. 10, 13
3/3	8	Digestive System; Respiratory System	Chap. 13, 11
3/10	9	Respiratory and Circulatory Systems	Chap. 11, 12
3/17	10	Spring Break!	
3/24	11	Excretory System and Osmoregulation; Review	Chap. 14
3/31	12	<b>Exam</b> ; Reproduction	Chap. 14
4/7	13	Reproduction and Endocrine Systems	Chap. 14, 15
4/14	14	Nervous System, Cranial Nerves	Chap. 16
4/21	15	Regeneration, Review, <b>Exam</b>	Chap. 16, 17

**Tentative exam dates:** Exam 1- week of **2/17**; Exam 2- week of **3/31**; Exam 3- week of **4/21** (*all non-cumulative*).

## LABS (SEE LAB SYLLABUS)

Before your lab session, handouts and readings will be made available to aid you in the dissections. The current plan is to have pre-lab quizzes conducted in Canvas Quizzes, and 2 lab exams. Should this change you will be alerted via Announcements and in Lecture. You are **strongly** encouraged to study the material before the lab and be prepared going in - not doing so is the #1 regret of students from previous semesters.

## COURSE POLICIES

### Communication with Dr. Fraser

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 in person or via Canvas. If you email Dr. Fraser directly, please include your course code. All communication with instructors, TAs, and other students should be kind and respectful. Disrespectful communication will not receive a response.

### **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 on the assignment and a drop in one letter grade of your final grade. and reporting to the Dean of Students' Office Student Conduct Committee.

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). For additional information on Academic Honesty, please refer to the University of Florida Academic Honesty Guidelines at:

<https://dso.ufl.edu/resources/student-handbook/>

### **Grading discrepancies**

Concerns regarding the accuracy of graded assignments (lab 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), 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 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.

### **Disability Resource Center**

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.

### **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.counseling.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.

## **SUGGESTED STUDY METHODS**

### **Come to class and participate**

There is tremendous variation in how people learn and in the foundation they have upon entering this course. However, I work very hard to make sure that you have the knowledge and the study techniques to do well in this course. I show you how to work, but you do have to put in the work. Participation is the key here- come to class, engage, and participate.

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

There are around 70 other students in the class trying to learn the same material. Use Canvas discussion boards to ask and answer questions as you prepare for exams. 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. *Comments on discussion boards are read by all students and instructors, so make sure your comments are appropriate and respectful.*

### **If you do not understand- please ask! No question is a silly question.**

I will be holding office hours that I encourage you to attend with any questions- do not wait until after the exam to clarify concepts. Please come by if you are having any trouble at all.

### **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 a heavy 16 credit hours, then this course is 1/4 of your course load. So, that's  $1/4 \times 40 \text{ h} = 10 \text{ h}$  you should spend on this course.  $10 - 3 \text{ h lecture} - 3 \text{ h lab} = 4 \text{ h}$  you should spend outside of class each week or about **1 h per day for 4 days per week**. If you are spending more time than this, please talk to me about how to optimize your study techniques. If you are spending less time than this, you may struggle to learn the material well enough to do well on exams. I encourage you to look at this as "1 hour per day" throughout the semester- cramming will not be your friend here.