

BIO 331 Comparative Vertebrate Anatomy – Spring 2023

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Office Hours: Monday 11:00-12:50
Tuesday 10:30-12:50 or by appointment

Course Description:

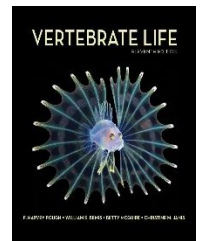
This course emphasizes understanding the functional and comparative anatomy of the vertebrates through exploration of vertebrate structure and function from an evolutionary perspective. Protochordates, lamprey, dogfish shark, mudpuppy (salamander), and cat are dissected to compare the basic architectural patterns of vertebrate systems and to discover ways in which existing structural patterns are modifications of ancestral patterns.

Student Goals and Class Objectives:

1. Understand and describe the basic architectural patterns of vertebrate systems.
2. Recognize the taxonomic relationships between different vertebrate classes, and the anatomical basis for hypotheses about phylogeny.
3. Interpret the modifications of ancestral patterns reflected in existing structural features.
4. Understand the importance of anatomical structure as it relates to function.
5. Develop and improve dissection skills and demonstrate the ability to identify correctly anatomical features.

Required Text:

1. Pough et al. 2022. *Vertebrate Life*. (11th ed.): Oxford University Press



Course Policies:

Open Office:

Open office times are dedicated times during which I do not have set meetings where I am available on a first come first serve basis to talk with students. You are invited to come by my office for any reason. Some examples of topics during office hours include career advice, research questions, college advice, saying hello, asking for a pop tart because you missed breakfast, seeking recommendation letters, coursework, and course material. One need not think of the “perfect question” to come to open office hours. If students need to speak with me outside of the times listed above send an email and make an appointment at any time.

Course Center:

These hours will take place in a classroom in the science building. These are dedicated times where students will be able to meet with one another, tutors, and myself, in groups or alone. During this time students will also be afforded an organized space in which they are encouraged to study, ask questions about course material, and work on group work. While this is an open format space, we do wish to maintain this time as a course-work specific time. If one wanted to ask questions pertaining to something other than coursework, please make an appointment or drop by office hours.

Attendance:

Class attendance requirements are outlined in the Department of Biology Attendance Policy posted [here](#). As outlined in this policy, it is your responsibility to make contact prior to absences for illness and within 24 hours regarding unforeseen emergencies. Unexcused absences from class will count as a **5% reduction from the class participation grade per absence**. Unexcused absences from lab will count as a **2% reduction from the overall course grade per absence**. Missing class time will result in partial deductions if the time is excessive (>15 mins).

Class Discussions and Professionalism:

Class discussions will be conducted on various topics throughout the semester. Class discussions will be conducted respectfully and professionally. We will use proper terminology to discuss topics. Each student is expected to be respectful of their peers and to hold everyone, including me, responsible for properly addressing students by their chosen names, pronouns, and respective titles and using proper terminology in discussions. If any student wishes to discuss class discussion, content, or any other aspect of class with me they are welcome and encouraged to do so.

BIO 331 Comparative Vertebrate Anatomy – Spring 2023

If you feel uncomfortable speaking with me for any reason, I encourage you to contact the [Office of the Dean of Students](#) with your concerns.

Diversity, Equality, and Inclusion in this Course

Much of recorded science is subjective and has been historically based on the ideas and hypotheses of a collection of privileged voices. The readings in this course are based in part on the work done by this small and privileged group of individuals that are (were) white men. We will discuss research and work done by scientists that have subsequently, some quite recently, been recognized as leaders in the field of comparative vertebrate anatomy and functional morphology that do not identify as white men. Should you come across any contributions to this field that you think we ought to incorporate into our coursework or simply wish to discuss the merits of in light of this topic, please feel free to contact me in person, via email, or anonymously (by leaving a note either under my office door or in the building secretary's office on the third floor).

My expectations are that we will be a learning community that appreciates the successes, struggles, and skill sets that we each bring to this class and that we will learn from one another. This course will be a learning environment that is comfortable for students to explore comparative vertebrate anatomy. It is within that goal that this course will support and enrich student learning by using diverse learning styles in classroom discussions, promoting individualized thinking styles, honoring each student's perspectives and experience, and by being respectful of all members of our learning community.

Exams and Grading:

Deadlines are given below in the course calendar but will also be communicated in class. If an accommodation, illness, or other event causes a student to require a flexible deadline for any assignment, then the student must reach out prior to the due date (sudden illnesses – COVID, accidents, etc. – should be communicated as soon as reasonably possible). Flexible deadline requests are entirely the responsibility of the student; reach out to me with the length of extension you need so that we can discuss how to make sure your work is completed in a timely manner.

If a student is interested in an honors module for this course I ask that they please contact me within the first two weeks of class so that we can plan appropriately.

Class Tests:

Tests may consist of short answer, multiple choice, and essay questions. Test material will consider only classroom material. These will be further discussed during class time. **100 pts. each**

Final Exam:

The final exam will be cumulative and cover the entire semester's worth of information. All topics of comparative anatomy will be eligible for the final. **100 pts.**

Class Participation:

Attending class is important for fully understanding any subject. In addition to attending and participating in typical classes, we will also do some activities, as spacing and time permit to show how physiology works. **4 pts. each class/lab**

Classwork:

Classwork will consist of group work as well as solo assignments that students will either work on in class or are expected to produce outside of class. These will include clinical discussion questions, video explanations, and other work as discussed during class. All of this work serves to identify key functions, structures, and anatomical background for the student of human anatomy. **5 pts. each**

Lab Reports:

In lieu of lab exams this class will employ of a series of lab reports in which the student will detail experiences in lab

BIO 331 Comparative Vertebrate Anatomy – Spring 2023

and knowledge and understanding derived from each dissected animal. More information will be provided in lab as to what each lab report will contain. **25 pts. each**

Lab Notebooks:

Lab notebooks are important to maintain throughout dissection to better help with the lab reports. We will check in a few times during the semester to ensure that we are all maintaining a well-kept notebook and that all of our illustrations and information are up to date. **100 pts.**

Comparative Lab Presentations:

Students will prepare and present presentations on the evolutionary changes of an organ system. Dissected specimens will assist in the development and presentation of this project. **100 pts.**

Grading:

The point breakdown for the course will be as follows:

Class Tests:	- worth 400 points
Final Exam	- worth 100 points
Class Participation:	- worth 150 points
Classwork:	- worth 50 points
Lab Reports:	- worth 100 points
Lab Notebooks:	- worth 100 points
Comparative Presentation:	- <u>worth 100 points</u>
	Total 1000 points

Grading Scale for Final Grades in This Class:

> 98	A+	93-98	A	90-92	A-
87-89	B+	83-86	B	80-82	B-
77-79	C+	73-76	C	70-72	C-
67-69	D+	63-66	D	60-62	D-
		<60	F		

Academic and Health Support Services:

Academic Learning Center:

The ALC offers various resources to assist Albright students with their academic success at no charge. The ALC offers course-specific peer tutoring for many general education classes at the 100-200 level. You can schedule to meet with a peer tutor in person or online by selecting the '[ALC Subject Tutor Schedule](#)'. Peer tutoring takes place in the ALC Subject Area Tutoring Lab located in the outdoor tunnel near Jake's Place. The ALC also offers one-on-one academic coaching for upper class students on study skills, time management, note-taking, and learning strategies. (The Office of Student Success offers academic coaching for first-year students.) To schedule an academic coaching meeting with a staff member in the ALC, contact by phone at 610-921-7662 or [by email](#). The ALC main office in Teel Hall 309A.

Writing Center:

You are encouraged to visit the Writing Center early and often throughout the semester to help build a strong foundation for writing in this course and in all of your courses. In-person and online sessions are available. The center's peer tutors and director will work with you at any stage of the writing process, from developing and organizing ideas to revising and editing drafts. Rather than editing your work for you, writing tutors will actively engage you in meaningful conversations about your writing and help you learn new strategies. Tutors are also available to discuss approaches to managing the college reading workload and reading more effectively. The center is located in Jake's Place near the mailroom and can be reached at 610-921-7540 (phone) or [by email](#). (Note: For Fall 2021, the Writing Center will be in Teel 309-B until the Campus Center construction is completed). For the current schedule or to make an appointment for an in-person or online session, use our [appointment system](#).

BIO 331 Comparative Vertebrate Anatomy – Spring 2023

Gingrich Library:

The [Gingrich Library](#) provides resources to assist Albright students with their class projects and research needs. Library materials include books, e-books, print and electronic journals, databases and DVDs. All students have complete access to the Gingrich Library catalog, electronic books, and its electronic databases from on-campus, in residence halls or off-campus. Reference librarians are available in the Center for Computing and Mathematics (CCM) to answer questions and help students use resources and find appropriate materials. Students are encouraged to [contact a librarian](#) at any stage of the research process. Real-time chat services are available through the library's portal at the library's main page. The portal to the library can be [reached from here](#).

Office of Student Accessibility and Advocacy:

Consistent with the ADA and Section 504 of the Rehabilitation Act, Albright College welcomes students with disabilities into the college's educational programs. If you need impairment-related academic adjustments in this course, please contact the Student Accessibility and Advocacy office, by email at SAA@albright.edu or by phone at 610-921-7503. Our online application and is available in the student health portal. SAA staff are available to help with the application if requested. The SAA office is in the Student Center Conference Room. Students should contact the office to schedule an appointment. Students who use accommodations should meet with course instructors privately and in a timely manner to discuss their Academic Accommodation Letter (AAL). *Please note that IEPs and 504 plans do not apply to college-level courses.* Student AALs may be printed from the student health portal. Students should contact the SAA office if they need assistance retrieving their letters.

Academic Integrity:

The College policy on dishonesty as stated in the section "Academic Dishonesty Policy" in the current Albright College Catalog applies to all aspects of this course, including exams and papers. Academic dishonesty is taking credit for another person's work and attempting to pass it off as your own. It includes: 1) copying from another student during exams and quizzes; 2) allowing someone to copy from you or providing someone with a copy of your work that results in plagiarism; 3) Presenting someone else's ideas as your own without express permission and crediting them; 4) Plagiarizing (copying) material from books, articles, and electronic sources for direct use in your work; 5) using cheat sheets, notes, cell phones, etc. to gain outside information during a test or quiz. A student charged with academic dishonesty will be given written or oral notice of the charge, will receive an F on the assignment in question, and the case will be referred to the Provost. At the Instructors' discretion, the student may receive an F for the course. Repeat offenses, in one class or different classes can lead to more severe penalties (e.g. academic dismissal). Please familiarize yourself with this policy.

Classroom Recording Policy:

The audio or visual recording of class lectures, discussions, simulations, and other course-related activity by either students or instructors is governed by the College's class recording policy, available in the Catalog. Albright's policy on class recording balances the needs of students who are differently abled, the intellectual property concerns of its instructors, and the privacy of its students. Any audio or visual recording made by a student during a class, regardless of the recording device, requires the instructor's written consent prior to the class and the student's signed agreement with the terms of the College's policy. Prior to a student recording of any class activity, the student and the instructor must sign a recording agreement and file it with the Office of Student Accessibility and Advocacy (if the recording is an approved disability accommodation) or with the Academic Dean's office (if not an accommodation). Violations of this Class Recording Policy may be directed through academic dishonesty procedures or the Office of Community Standards, and could involve civil or criminal violations.

Mental Health Matters:

The [Gable Health and Counseling Center](#) offers students the chance to meet with therapists at no charge. Students are encouraged to make appointments to receive confidential care for small and large issues. If you, or anyone close to you on campus, are suffering from any mental health issues, you are encouraged to reach out and use the services on campus to get the care you need. The office is open from Monday through Friday 8:30am - 4:30pm and appointments are scheduled from 10-6 M-TH and 9-5 on Fridays. Students can set up a meeting with a therapist on campus by walking to the Gable Health Center located on campus at 1829 Linden Street or by calling the Gable Health Center at 610-921-7532.

BIO 331 Comparative Vertebrate Anatomy – Spring 2023

Class Schedule

Some readings will be available on Canvas. Some sections of the book will be assigned multiple times as appropriate for class material.

Class	Topic	Classwork/Exams	Readings
1/24	Course Introduction, basic concepts of CVA		Ch. 1
1/26	Chordates: Characteristics and origins	Vert or Invert?	Ch. 2
1/31	Embryology, organogenesis, and ontogeny		Module 2
2/2	Basic biomechanics	Gettin' Around	Module 3
2/7	Phylogenetics	Phylogenetics Practice	Ch. 1
2/9	Introduction and Basics Exam	Exam (2-9)	Chs. 1, 2
2/14	Agnathans, Gnathostomes, Teleosts		Chs. 3, 4, 6
2/16	Tetrapods and Amniotes	Getting onto Land	Chs. 8, 9
2/21	Integument		Pgs 32, 104, 131-132, Sec. 11.7, 12.3/4, 21.2, 22.3
2/23	Skull and head		Sec. 3.4/5, 4.2, 6.2, 9.3, 11.1/6, 15.3, 16.1, 21.5/6, 22.1/2, 23.5
2/28	Locomotor and body support skeleton	Skeleton Exercise	Sec. 3.4/6, 7.6, 8.6, 9.2, 11.1/2, 16.1, 18.3, 21.3/4, 23.6
3/2	Skin, Skeleton, and History Exam	Exam (3-2)	
3/7	Muscular system: Fish		Sec. 2.6, 6.2/5, 7.6
3/9	Muscular system: Tetrapods		Sec. 11.1, Module 3
3/21	Circulatory system: Anamniotes		Module 4
3/23	Circulatory system: Amniotes	Practice Descriptions	Sec. 11.5, 12.3, 13.3, Module 4
3/28	Circulation and Thermoregulation		Ch. 14
3/30	Muscles and Circulation Exam	Exam (3-30)	
4/4	Respiratory System		Sec. 4.1, 11.4, 12.3, 13.1/2, Module 4
4/6	Digestive System: Herbivores		Sec. 15.2, 17.3, 21.5, 23.5, Module 5
4/11	Digestive System: Carnivores and Omnivores	Animal Diets	Sec. 15.2, 17.3, 21.5, 23.5, Module 5
4/13	Waste and Endocrine: Fish		Sec. 4.3/4, Module 6
4/18	Waste and Endocrine: Tetrapods	Animal Wastes	Sec. 11.7, 13.4, Module 6

BIO 331 Comparative Vertebrate Anatomy – Spring 2023

Class	Topic	Classwork/Exams	Readings
4/20	Breathing, Nutrition, and Wastes Exam	Exam (4-20)	
4/25	Reproductive System: Anamniotes		Sec. 6.2, 7.7, 12.2, Module 6
4/27	Reproductive System: Amniotes	Shell or No?	Sec. 15.6, 16.4, 17.5, 18.2, 19.4, 21.8/9, 22.3, 23.4
5/2	Central Nervous System		Module 7
5/4	Special Senses	Sensational!	Sec. 4.2, 11.6, 21.6/7, Module 8
Final	Final Exam	Final Exam	

Laboratory Information:

Laboratory exercises in this class will be explorations of anatomy. We will begin each lab with a few notes on structures before "discovering" anatomy. We will not be testing hypotheses in this course. Your mastery of the information will be demonstrated through two lab tests and one final project. This project will be constructed through your hard work over the semester and represent your skills and knowledge acquired over the semester. Anatomical structure sheets are provided which allow you to present, analyze and discuss your data, will provide a mechanism for you to demonstrate your understanding of the more experimental laboratory exercises.

Lab Safety:

Students are expected to **follow all lab safety rules at all times**, including arriving in lab with appropriate footwear. Students who are not wearing proper footwear will be sent away to procure acceptable footwear. At times we will be using sharp tools. Safe use of tools will be further explained in labs but includes properly securing tools when not in use and proper handling of tools. **Food, drinks, candy, gum, and other consumables including tobacco and vaporizer products are not permitted in laboratory spaces.** Any food, drink, or other consumables brought into lab must be disposed of. Failure to follow proper safety procedures may lead to dismissal from the lab, at the discretion of the instructor or the Environmental Health and Safety Officer. A handout on safe lab practices will be provided, which must be signed by the student prior to participation in the lab.

Laboratory Schedule

This schedule is subject to change due to student interest and laboratory needs. All changes will be announced through Canvas ahead of the class meeting.

Class	Topic	Classwork/Reports
1/23	Intro to lab, Protochordates and Amphioxus	
1/30	<i>Petromyzon</i> I	
2/6	<i>Squalus</i> I	<i>Petromyzon</i> Report Due (2-6)
2/13	<i>Squalus</i> II	
2/20	<i>Squalus</i> III	
2/27	<i>Squalus</i> IV	
3/6	<i>Lithobates</i> I	<i>Squalus</i> Report Due (3-6)
3/13	Spring Break	
3/20	<i>Lithobates</i> II	

BIO 331 Comparative Vertebrate Anatomy – Spring 2023

Class	Topic	Classwork/Reports
3/27	<i>Lithobates</i> III	<i>Lithobates</i> Report Due (4-3)
4/3	<i>Felis</i> I	
4/10	<i>Felis</i> II	
4/17	<i>Felis</i> III	
4/24	<i>Felis</i> IV	
5/1	Presentations	Anatomical Presentations; <i>Felis</i> Report Due (5-1)