

**Moravian College**  
Department of Biological Sciences  
Biology 310 – Mammalian Anatomy  
Fall 2012

**Instructor:** Dr. Fran Irish  
**e-mail:** [frish@moravian.edu](mailto:frish@moravian.edu)  
**Office hours:** Monday, Wednesday, and Friday 9 a.m. – 10:30 a.m. and Wednesday 1:00 pm - 2:30 pm, or by appointment.

**Office Phone:** 610-861-1427  
**Office:** HOSCI 321

**Lecture:** Monday, Wednesday, and Friday 7:50 – 8:40 a.m., PPHAC 335  
**Laboratory:** Monday 1:15 p.m. – 4:15 p.m., HOSCI 302 *Note time change!*

**Required Textbook:** *Vertebrates: Comparative Anatomy, Function, Evolution, 6<sup>th</sup>. Edition*, by Kenneth V. Kardong, 2011.

**Required Lab Manual:** *Comparative Vertebrate Anatomy: A Laboratory Dissection Guide, 6<sup>th</sup>. Edition*, by Kenneth V. Kardong and Edward Zalisko, 2011.

**Other required equipment:** dissection kit (we can provide one, but you might want to buy your own), goggles (bookstore, if you don't have them already), lab coats (provided), loose-leaf binder with lined and unlined paper for lab notebook.

**Course Description:** An in-depth exploration of the structure and function of vertebrate animals in an evolutionary context. Laboratory exercises examine the structural diversity of vertebrate organ systems through dissection of representative vertebrate classes. This course is designed to provide a strong foundation in anatomy for students going on to a graduate or professional school in the human health or veterinary sciences.

**Prerequisites:** Biology 112.

**Course Objectives:** By the end of this course, students should:

1. Know the current views on the origin of vertebrates.
2. Recognize the basic body plan common to all vertebrates due to shared ancestry.
3. Be familiar with the major vertebrate clades and their diverse adaptations.
4. Be able to identify and provide a basic description of how major vertebrate organ systems function.
5. Know basic anatomical terms and descriptors.
5. Attain proficiency in observational skills and the art of dissection.

**Blackboard:** All information associated with this course will be posted on Blackboard. I recommend that you check the announcements regularly for news about quizzes, review sessions, etc. You must register yourself for this course on Blackboard *as soon as possible*---your opportunity to register will expire on Tuesday, September 4<sup>th</sup>. For instructions, see the following link:

<http://home.moravian.edu/public/cit/help/blackboard/bbstudent.asp>

The course ID is BIOL310.FA12 and the enrollment code is "anatomy." If you have difficulty with this, PLEASE E-MAIL ME IMMEDIATELY!

**LECTURES:** My lectures will generally be in the form of power point presentations, though I may decide to follow some other format if I find it more effective. I will post the power point lectures on Blackboard the evening before each class. It is your responsibility to download the lectures and print them for your use in the classroom so that those of you who are slow note-takers or abysmal artists will not be struggling to keep up, and all of you can attend more carefully to what I say. HOWEVER, the posted lectures will not contain everything I say--- you will have to add the details if you are to have an effective study aid. THUS, tempting though it may be, you cannot skip the lectures without jeopardizing your grade, either directly (by lowering your class participation grade) or indirectly (by leaving you behind in the dust). If I see that attendance is dropping, I will stop posting the lectures.

**Lecture attendance:** Students may miss class twice with no penalty (this includes illness, athletic activities, field trips, etc.). If you anticipate missing more than two classes, contact me as soon as possible.

**Policy on electronic devices:** Cell phones and ipods must be turned off during lecture (this means you cannot text your friends). I do not encourage the use of laptops in class, as the temptation to play games, converse with friends, etc., appears to be irresistible, and is disruptive for those around you. If you feel it is vital to bring a laptop to take notes, you must: 1. Convince me it is necessary. 2. Sit in the front row of the class. 3. Actually take notes.

**Reading assignments:** Please read the relevant chapters from the textbook (listed on the lecture schedule) before each lecture to get a feel for the material I will be covering. After class, use the text to amplify your lecture notes in areas you don't understand. Please note *Appendix C: Greek and Latin combining forms*; this will help make sense of anatomical terminology

**Study questions:** I will post study questions every weekend covering the previous week's lectures. Because many of the essay questions on exams are taken from these study questions, *it is in your best interest to write the answers to these questions every weekend* (but do not try to answer them all the night before the exam).

**Lecture quizzes:** At the beginning of class on Mondays, there will be a short quiz (10 points) covering the lectures from the previous week. This is not done to make your life miserable, but to encourage you to keep up with the class by reviewing the lectures each week. I will announce any changes to the quiz schedule---but when in doubt, assume we are having a quiz. Plan to arrive for class on time, as *late arrivals will not be allowed to take the quiz, and missed quizzes cannot be made up*. You are allowed to miss 2 quizzes without penalty, but you must contact me to explain your absence. At least 1 quiz grade will be dropped when computing your final grade.

**JOURNAL PAPER PRESENTATION:** Readings of current original research papers in the field of functional or evolutionary vertebrate anatomy will supplement the lecture material. Working in pairs, you will select a topic and give an oral presentation of a journal paper related to that topic to the class during the first 15 minutes of that lecture day. Your presentation should take ~12 minutes leaving 3 minutes for class questions. The paper must be selected from recent issues (1980 to present) of a peer-reviewed journal and must be on functional or evolutionary vertebrate anatomy. I must approve the paper and you must provide me with a copy at least one week prior to your

presentation. You will be graded on your oral presentation and a single spaced, typed critique (2 page limit) of the paper to be turned in at the time of the oral presentation. Both written critique and presentation should address the goals of the research, the methods employed to carry out those goals and their appropriateness, what was learned from the study, were the conclusions supported by the data, what contributions did the study make to the field, were there any limitations to the study, and how might the study be improved or expanded in the future.

**LABS:** You are expected to read the assigned lab exercises BEFORE coming to lab (this includes both the assigned sections of the lab manual and the lab handouts, which will be distributed before the lab and posted on Blackboard). Please bring your lab manual and lab notebook to every lab.

**Lab attendance:** Don't even consider missing a lab unless you are ill or have some other emergency. IT IS THE STUDENT'S RESPONSIBILITY to arrange to make up a missed lab before the next lab quiz or practical. Be aware that it may not be possible to make up exercises involving live material, and I may not be available to guide you as I would during the scheduled lab period. Make-up labs will be offered at the discretion of the instructor.

**Lab notebook:** Critical observation is absolutely essential to science. Therefore, I ask that you bring a loose-leaf binder with blank lined and unlined paper to lab. This binder will hold all lab handouts, plus your notes and drawings. The goal of this exercise is to hone your powers of observation and provide you with a useful study tool. The lab handouts will tell you what information must be included in your lab notebook, but you will receive extra credit for any extra drawings, notes, etc. that you include. Your lab notebooks will be handed in at the beginning of each lab practical, graded, and returned by the next lab period.

**Lab quizzes:** At the beginning of each lab after the first, there will be a 10-point quiz on the material assigned for the previous week's lab. Each quiz will be in the form of a "mini-practical." The quizzes are designed to help you master the required material and prevent panic before the two 100-point lab practicals.

**EXAMS:** Please see the lecture and lab calendars below for the exam schedule. Make-up exams will be given at the discretion of the instructor. It is the student's responsibility to contact the instructor BEFORE the missed exam, provide an appropriate excuse, and make arrangements to take the exam at another time. LAB PRACTICALS CANNOT BE MADE UP. If your absence is not excused, you will receive a 0 for the missed exam.

***Absolutely no activated electronic devices will be allowed during exams (this includes cell phones and ipods).*** If you are seen using one of these devices for any reason during an exam, you will receive a "0."

**GRADING:** Your scores for all assignments and exams will be posted on Blackboard, so you can see how you are doing at any time (check the percentage listed in the "total points" column). The grading scale will be posted following the first lecture exam. There will be no extra credit options beyond the occasional extra question on exams, so please focus your energy on what we are doing in class and lab.

3 lecture exams (75 points each)	225 points	
Final lecture exam	150 points	
lecture quizzes/homework (10 points each)	100 points	LECTURE: 475 points
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2 lab practicals (100 points each)	200 points	
10 lab quizzes (10 points each)	100 points	
Laboratory notebook	60 points	
Quality and thoroughness of dissections	40 points	LAB: 400 points
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Presentation of research paper	75 points	
Class participation*	<u>50 points</u>	
<b>Final grade</b>	<b>1000 points</b>	

\*Class participation includes attendance, preparation for class and lab, participation in discussions, and completion of all assignments. Please note that the instructor may exercise qualitative judgment in determining your final grade.

**Disability support:** Students who wish to request accommodations in this class for a disability should contact Elaine Mara, assistant director of learning services for academic and disability support at 1307 Main Street, or by calling 610-861-1510.

Accommodations cannot be provided until authorization is received from the Academic Support Center.

**Policy on honesty:** Students are expected to abide by the college policy on intellectual honesty (see Student Handbook).

**TIPS FOR DOING WELL IN THIS COURSE:** If you find yourself falling behind, or you are struggling to learn the material, *please contact me right away*. I am here to help you!

Lecture exams:

1. \*\*\*Come to class\*\*\*
2. Do not fall behind---review and annotate your lecture notes, using the text to clarify things you do not understand. If the text cannot help you, please ask me. My opinion of you will not plummet if you ask a question, so don't be shy.
3. Review for each Monday quiz.
4. *Write out* the answers to the study questions posted each weekend. *Think* about these questions as you answer them.
5. You are responsible for knowing the material I present *in lecture*---I encourage you to read relevant sections of the textbook, but *do not try to memorize the textbook*.

Lab quizzes and practicals:

1. Attend all labs.
2. Prepare for each lab by reading the lab exercise *before* you walk into the lab.
3. Do not try to race through the lab exercises---be sure you understand what you are supposed to see, and be sure you actually see it before you leave. If you are confused, ask questions---I am there to help you!
4. Put care and effort into your lab notebook. You may find the lab practicals challenging, but the notebook grade is directly under your control.

5. Come to the “open lab” review sessions before the lab practicals, and prepare by making a list of the things you need to review. Listen to the other students---they may ask things you didn’t think about.

Vocabulary:

1. The single greatest barrier to learning anatomy is the vocabulary. Do whatever you need to do to learn the terminology----flashcards, glossaries, diagrams, study groups, etc.

### LECTURE SCHEDULE

Week	Lecture topic	Text reading
August 27	M 1. Protochordates	Chapter 2
	W 2. Chordate origins	Chapter 2
	F 3. Vertebrate origins	Chapter 3
September 3	M <b><i>LABOR DAY---NO LECTURE OR LAB</i></b>	
	W 4. Ontogeny	Chapter 5
	F 5. Systematics	Ch. 1, p. 20-29
September 10	M 6. Integument	Chapter 6
	W 7. Integument, continued	Chapter 6 *
	F 8. Teeth	Ch. 13, p. 506-516
September 17	M <b>LECTURE EXAM 1 (75 points)</b>	
	W 9. The skull	Chapter 7
	F 10. Skull, continued	Chapter 7
September 24	M 11. Introduction to skeletal tissues	Chapter 5
	W 12. Axial skeleton	Chapter 8 *
	F 13. Appendicular skeleton	Chapter 9
October 1	M 14. Vertebrate diversity: Fish to tetrapods	Chapter 3
	W 15. Vertebrate diversity: Amphibians to lizards	Chapter 3
	F 16. Vertebrate diversity: amniotes	Chapter 3
October 8	M <b><i>FALL BREAK--- NO LECTURE OR LAB</i></b>	
	W 17. Vertebrate diversity: synapsids	Chapter 3 *
	F 18. Introduction to muscle systems	Chapter 10
October 15	M <b>LECTURE EXAM 2 (75 points)</b>	
	W 19. Muscle systems, continued	Chapter 10
	F 20. Digestive systems	Chapter 13 *

October 22	M	21. Digestive systems, continued	Chapter 13
	W	22. Digestive & respiratory systems	Chapter 13, 11 *
	F	23. Respiratory systems	Chapter 11
October 29	M	24. Circulatory systems	Chapter 12
	W	25. Circulatory systems	Chapter 12 *
	F	26. Urogenital systems	Chapter 14
November 5	M	27. Urogenital system	Chapter 14
	W	28. Reproductive systems	Chapter 14 *
	F	29. Introduction to the nervous system	Chapter 16
November 12	M	<b>LECTURE EXAM 3</b> (75 points)	
	W	30. Central nervous system	Chapter 16
	F	31. Peripheral nervous system	Chapter 16
November 19	M	32. Autonomic nervous system	Chapter 16 *
	W-F	<b><i>NO LECTURES---THANKSGIVING</i></b>	
November 26	M	33. Sensory organs	Chapter 17
	W	34. Sensory organs, cont'd.	Chapter 17 *
	F	35. Endocrine system	Chapter 15
December 3	M	36. Endocrine system, cont'd	Chapter 15
	W	37. Endocrine system, cont'd	Chapter 15
	F	38. Catch-up & review	

\* presentation date

**THURSDAY, DECEMBER 13<sup>TH</sup>, 1:30 PM--FINAL LECTURE EXAM (150 points)**

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### EXAM SCHEDULE

September 17: Lecture exam 1 (75 points)

October 1: Lab practical 1 (100 points), lab notebook due (30 points)

October 15: Lecture exam 2 (75 points)

November 12: Lecture exam 3 (75 points)

December 3: Final lab practical (100 points), lab notebook due (30 points)

December 13: Final lecture exam (150 points)

## LABORATORY SCHEDULE

<b>Week</b>	<b>Laboratory topic</b>	<b>Laboratory exercise</b>
August 27	Lab 1: Protochordates and lamprey	Exercise 1
September 3	<b><i>NO LAB---LABOR DAY</i></b>	
September 10	Lab 2: The vertebrate integument	Exercise 4
September 17	Lab 3: Skull & teeth	Exercise 5
September 24	Lab 4: Axial & appendicular skeleton, Skeletal tissues	Exercise 5
October 1	<b>LAB PRACTICAL (100 points)</b>	
October 8	<b><i>NO LAB---FALL BREAK</i></b>	
October 15	Lab 5: Muscles of the cat (forequarters)	Exercise 6
October 22	Lab 6: Muscles of the cat (hindquarters)	Exercise 6
October 29	Lab 7: Digestive systems	Exercise 7
November 5	Lab 8: Circulatory systems & heart, Respiratory systems	Exercise 8
November 12	Lab 9: Urogenital systems	Exercise 9
November 19	<b><i>NO LAB---THANKSGIVING</i></b>	
November 26	Lab 10: Brain & cranial nerves	Exercise 10
December 3	<b>FINAL LAB PRACTICAL (100 points)</b> Lab clean-up	

*Please note: this syllabus acquaints you with the topics I hope to cover in the order I hope to cover them, but I may make changes as we progress through the semester.*