Moravian College

Department of Biological Sciences Biology 310 – Vertebrate Anatomy Fall 2013

Instructor: Dr. Fran IrishOffice Phone: 610-861-1427e-mail: firish@moravian.eduOffice: HOSCI 321Office hours: Monday, Wednesday, and Friday 9 a.m. – 10:30 a.m. and
Wednesday 1:00 pm - 2:30 pm, or by appointment.

Lecture: Monday, Wednesday, and Friday 7:50 – 8:40 a.m., PPHAC 233 Laboratory: Monday 1:15 p.m. – 4:15 p.m., HOSCI 303

Required Textbook: Vertebrates: Comparative Anatomy, Function, Evolution, 6th. Edition, by Kenneth V. Kardong, 2011.

Required Lab Manual: Comparative Vertebrate Anatomy: A Laboratory Dissection Guide, 6th. 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.
- 6. 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 3rd. For instructions, see the following link:

http://home.moravian.edu/public/cit/_help/blackboard/bbstudent.asp

The course ID is BIOL310.FA13 and the enrollment code is "anatomy." If you have difficulty with this, PLEASE E-MAIL ME IMMEDIATELY!

LECTURES: My lectures will be in the form of power point presentations, which will be posted on Blackboard after the previous lecture (two days 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 sleep in without jeopardizing your grade, either directly (by lowering your class participation grade) or indirectly (by leaving you behind in the dust). And yes, you do need to take notes.

Lecture attendance: I know this is an early class, but I expect you to attend class and arrive on time. Students may miss class three times with no penalty (this includes illness, athletic activities, field trips, etc.). If you miss more than three classes, I will deduct 10 participation points for each day missed. If you anticipate missing more than three 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). You may bring a laptop or tablet to class to take notes, but if the temptation to play games, chat with friends, etc., appears to be irresistible, I will ask you to put the device away, as engaging in ancillary activities is distracting to those around you.

Reading assignments: I expect you to come to class prepared to discuss the assigned material, so please read the relevant chapter 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 after every lecture. Because many of the essay questions on exams are taken from these study questions, *it is in your best interest to write out the answers to these questions* (but do not try to answer them all the night before the exam).

Lecture quizzes: At the beginning of class on Fridays, 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 on that topic to the class during the first 15 minutes of the assigned lecture day. Your presentation should take 10-12 minutes leaving 3-5 minutes for class questions. The paper must be selected from recent issues (1990 to the 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 pdf or copy (electronic is fine) at least one week prior to your presentation. You will be graded on your oral presentation and a single spaced, typed summary/critique (3 page limit) of your chosen article to be turned in at the class following the oral presentation. Both written summary 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, and your views on 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 in class on the Friday before the lab and posted on Blackboard). Please bring your lab manual, handouts, 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 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 to lab (I will provide unlined paper for drawings). This binder will hold all lab handouts, plus your notes, drawings, and any written work assigned for the labs. The goal of the notebook 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. Each exercise will be graded in lab; if you are running behind, you may have until the next lab period (one week) to complete all required exercises.

Lab quizzes: We will not have regular lab quizzes, but I may give a quiz if I think it would further your learning. All quizzes will be announced.

EXAMS: Please see the lecture and lab calendars below for the exam schedule. Makeup 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. 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 (80 points each) | 240 points | |
|---|------------|---------------------|
| Final lecture exam | 160 points | |
| lecture quizzes/homework (10 points each) | 100 points | |
| Presentation of research paper | 50 points | LECTURE: 550 points |
| 2 lab practicals (100 points each) | 200 points | |
| muscle quiz (40 points) | 40 points | |
| Laboratory notebook | 100 points | |
| Quality and thoroughness of dissections | 50 points | LAB: 390 points |
| Class participation* | 40 points | |
| Final grade | 980 points | |

*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 ON TIME***
- 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 Friday quiz.
- 4. *Write out* the answers to the study questions posted after each lecture. *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 26 | M W F* | Protochordates Chordate origins Vertebrate origins | Chapter 2 Chapter 2 Chapter 3 |
| September 2 | M W F* | <i>LABOR DAYNO LECTURE OR LAB</i> 4. Systematics 5. Ontogeny | Ch. 1, p. 20-29 Chapter 5 |
| September 9 | M W F* | Ontogeny, cont'd Integument Integument, continued | Chapter 5 Chapter 6 Chapter 6 |
| September 16 | M W F | LECTURE EXAM 1 (80 points) 9. The skull 10. Skull and teeth | Chapter 7 Ch. 7, 13, p. 506-516 |
| September 23 | M** W** F* | 11. Introduction to skeletal tissues 12. Axial skeleton 13. Appendicular skeleton | Chapter 5 Chapter 8 Chapter 9 |
| September 30 |) M W F* | 14. Vertebrate diversity: Fish to tetrapods 15. Vertebrate diversity: Amphibians to lizards 16. Vertebrate diversity: amniotes | Chapter 3 Chapter 3 Chapter 3 |
| October 7 | M W F | 17. Vertebrate diversity: synapsidsLECTURE EXAM 2 (80 points)18. Introduction to muscle systems | Chapter 3 Chapter 10 |
| October 14 | M W** F* | <i>FALL BREAK NO LECTURE OR LAB</i> 19. Muscle systems, continued 20. Digestive systems | Chapter 10 Chapter 13 |

| October 21 | M** | 21. Digestive systems, continued | Chapter 13 |
|-------------|-----|--|------------------|
| | W** | 22. Digestive & respiratory systems | Chapter 13, 11 |
| | F* | 23. Respiratory systems | Chapter 11 |
| October 28 | М | 24. Circulatory systems | Chapter 12 |
| | W | 25. Circulatory systems | Chapter 12 |
| | F* | 26. Urogenital systems | Chapter 14 |
| November 4 | M** | 27. Urogenital system | Chapter 14 |
| | W** | 28. Reproductive systems | Chapter 14 |
| | F* | 29. Introduction to the nervous system | Chapter 16 |
| November 11 | М | LECTURE EXAM 3 (80 points) | |
| | W | 30. Central nervous system | Chapter 16 |
| | F | 31. Peripheral nervous system | Chapter 16 |
| November 18 | M** | 32. Autonomic nervous system | Chapter 16 |
| | W** | 33. Sensory organs | Chapter 17 |
| | F* | 34. Sensory organs, cont'd. | Chapter 17 |
| November 25 | M-F | NO LECTURES OR LABTHANKSGIV | ING |
| December 2 | М | 35. Endocrine system | Chapter 15 |
| | W | 36. Endocrine system, cont'd | Chapter 15 |
| | F | 37. Catch-up & review | 1 |
| | | 1 | * Quizzes |
| | | | ** Presentations |

FRIDAY, DECEMBER 13TH., 8:30 AM—FINAL LECTURE EXAM (160 points)

EXAM SCHEDULE

September 16: Lecture exam 1 (80 points)

September 30: Lab practical 1 (100 points)

October 9: Lecture exam 2 (80 points)

October 28: Muscle Quiz (40 points)

November 11: Lecture exam 3 (80 points)

December 2: Final lab practical (100 points)

December 13: Final lecture exam (160 points)

LABORATORY SCHEDULE

| Week | Laboratory topic | Laboratory exercise |
|--------------|--|---------------------|
| August 26 | Lab 1: Protochordates and lamprey | Exercise 1 |
| September 2 | NO LABLABOR DAY | |
| September 9 | Lab 2: The vertebrate integument | Exercise 4 |
| September 16 | Lab 3: Skull & teeth | Exercise 5 |
| September 23 | Lab 4: Axial & appendicular skeletor | n, Exercise 5 |
| September 30 | LAB PRACTICAL (100 points) Lab 5: Connective & muscle tissues | Exercise 5, 6 |
| October 7 | Lab 6: Muscles of the cat (forequarte | ers) Exercise 6 |
| October 14 | NO LABFALL BREAK | |
| October 21 | Lab 7: Muscles of the cat (hindquarte | ers) Exercise 6 |
| October 28 | MUSCLE QUIZ (40 points) Lab 8: Digestive systems | Exercise 7 |
| November 4 | Lab 9: Circulatory systems & heart, Respiratory systems | Exercise 8 |
| November 11 | Lab 10: Urogenital systems | Exercise 9 |
| November 18 | Lab 11: Brain & cranial nerves | Exercise 10 |
| November 25 | NO LABTHANKSGIVING | |
| December 2 | FINAL LAB PRACTICAL (100 pc Lab clean-up | oints) |

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.