

## **Biology (BIOE) 403: Functional Vertebrate Morphology Spring 2016 Lab Syllabus**

Thursday 2:10-5:00 pm, Friday 2:10 – 5:00 pm, HS 102

Robert Niese  
Robert.Niese@umontana.edu  
Office Hours will be during open lab and by appointment.

**Text:** Homberger and Walker, *Vertebrate Dissection*

There are also numerous websites, alternate dissection guides, and study guides that may help in the study of comparative anatomy.

**Lab handouts will be available on moodle in advance of lab** at <http://umonline.umn.edu>

It is your responsibility to print out handouts and finish all of the reading and pre-lab work *prior* to coming to the lab.

**Friday** sessions will generally be held at the Field Research Station at Fort Missoula. These sessions provide time in an active biomechanics and functional anatomy lab for **group research projects** on novel scientific questions. Thus the exact time and dates that you will be required to attend will depend on your project. Project assignments will be made in the first two weeks. At the end of the semester, you will write your own scientific manuscript, and perform a professional group presentation of the results of your research. Times of meetings will be announced, due dates are on the attached handout.

**Homework/Quizzes:** each lab (11 labs total) will have homework questions to be completed before lab and a quiz questions during lab (5 points total for each lab). Your lowest quiz/homework score will be dropped. Quizzes will provide examples of the types of questions on the **practical exams**.

**Exams** will consist of practical questions about structures, functions, and comparisons of anatomy. There will be *no* makeup quizzes or exams, period.

**Lab Points:**

Quizzes, Homework	50
1st lab practical	50
2nd lab practical	50
Group project	50
Participation/Preparation (20 pts)	
Group Evaluation (10 pts)	
Group Presentation (20 pts)	
	200 points

*All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and /or a disciplinary sanction by the University.*

*All students need to be familiar with the Student Conduct Code. The Code is available for review online at <http://www.umn.edu/SA/VPSA/index.cfm/page/1321>*

**Schedule (subject to revision)**

<u>Month</u>	<u>Date</u>	<u>Day</u>	<u>Lab and assignments</u>	
January	28	Thurs	Diversity (specimens, gathering morpho data)	
	29	Fri	Diversity (continued; suppl.)	
February	4	Thurs	Phylogenetic Analysis	
	5	Fri	No Lab, continue Phylogenetic Analysis	
	11	Thurs	Biomechanics Lab Field Station; Biomechanical techniques: sonomicrometry and strain gauges	
	12	Fri	Initial Meetings, All Groups, Field Station	
	18	Thurs	Lab 1a: Introduction to anatomy and chordates; post-cranial skeleton of cat	
	19	Fri	Lab 1b: Comparative post-cranial skeleton.	
	<b>25</b>	<b>Thur</b>	<b>First Draft of Proposal Due (Introduction)</b> Lab 2: Cranial skeleton anatomy and Comparative skulls: evolution/migration of inner ear ossicles	
	26	Fri	First Group Experiment Field Station	
	March	3	Thurs	Lab 3: Muscle dissection: proximal-appendicular, and major axial muscles
		4	Fri	Second Group Experiment Field Station
10		Thurs	Lab 4: Muscle dissection: distal forelimb and cranial musculature	
11		Fri	Third Group Experiment Field Station	
17		Thurs	Lab 5: Comparative Muscle Dissections	
<b>18</b>		<b>Fri</b>	<b>Final Draft of Proposal Due (Intro and Methods)</b> Finish Dissections, Lab Study, Prosections,	
<b>24</b>		<b>Thurs</b>	<b>Practical Exam I</b>	
25	Fri	Lab 6: Nervous System Brain and Eye		
April	31	Thurs	Lab 7: Circulatory system I dissection: the heart, arteries, and veins.	
	1	Fri	Lab 8: Circulatory system II	
	7	Thurs	Spring Break	
	8	Fri	Spring Break	
	14	Thurs	Lab 9: Respiration, Vocalization, Digestion	
	15	Fri	Open lab; Experiments or Analysis time	
	21	Thurs	Experiments or Analysis time	
	22	Fri	Review for Lab Practical 2	
May	<b>28</b>	<b>Thurs</b>	<b>Lab Practical 2</b>	
	29	Fri	Experiments or Analysis time	
	5	Thurs	Work on Presentations	
	<b>6</b>	<b>Fri</b>	<b>Symposium at Field Station</b>	
	<b>10</b>	<b>Wed</b>	<b>Final Paper Due</b>	

## **BIOE 403 2013 Research Projects**

**Initial meetings:** Each group will meet at the designated times to discuss the rationale behind the project. Literature will be distributed at this time to aid in a more detailed literature search in preparation for writing the proposals.

**Proposals:** Must be submitted by noon on the date specified. They must be submitted electronically (as a MS Word attachment) via email. Receipt will be confirmed by email. Editing suggestions will be made, and the rewrites will be due before starting the experiment. No late proposals will be accepted. Each person must write their own proposal.

**Experiments:** All group members are required to attend all parts of the experiment. Some may have both morning and afternoon times. The total amount of time for the experiment will be at least five hours.

**Manuscripts:** Must be submitted by noon on 11 December. They must be submitted electronically (as a MS Word attachment) via email. Receipt will be confirmed by email. Format should follow the *Journal of Experimental Biology* (<http://jeb.biologists.org>) . No late manuscripts will be accepted. Each person must write their own manuscript.

**Presentations:** There is a 30 minute slot for each presentation. Please allow 5 – 10 minutes for a question-and-answer session within that slot. Presentations must be made using MS Powerpoint and brought to the session (Field Station) via CD or USB key to upload to the presentation computer at least 15 minutes before the start of the session. All group members should play equal parts in the presentation. Details on format for proposals, manuscripts, and presentations will follow.