

## COURSE SYLLABUS

COURSE TITLE:	BIOL 361 Vertebrate Biology		
COURSE CODE:	22577	TERM:	Winter 2015
COURSE CREDITS:	3.0	DELIVERY:	Lecture & Practicum (Lab)
CLASS SECTION:	01	START DATE:	5 Jan 2017
LECTURE LOCATION:	rm 132 Archeology Bldg	LAB LOCATION:	rm 218 Biology Bldg
LECTURE TIME:	10:00 to 11:20 am T/Th	LAB TIME:	1:30-5:20 pm W or 1:30-5:20 pm Th
WEBSITE:	via PAWS/Blackboard		

### Course Description

An introduction to the biology of fishes, amphibians, reptiles, birds and mammals. The course will consist of a brief phylogenetic survey and an examination of the evolution of different vertebrate body systems. Emphasis will be placed on comparative morphology, embryology and physiology.

Prerequisite(s): BIOL 121 and 224 (formerly BIOL 203).

Note: Students with credit for BIOL 351 may not take this course for credit.

### Learning Outcomes

By the completion of this course, students will be expected to:

1. Explain at an introductory level the embryological origin of organ systems within the vertebrate body
2. Explain the major evolutionary relationships within vertebrate animals and their closest relatives
3. Articulate the language of anatomy, embryology and phylogeny at an introductory level
4. Identify and name anatomical structures in representative vertebrates
5. Know key events in the evolution of vertebrates and explain the major changes in the embryology and anatomy of the vertebrate body that accompanied this evolution
6. Incorporate the scientific literature into textbook knowledge about the animal tree of life and adapt their own knowledge as new information is generated.

Note: The University of Saskatchewan Learning Charter is intended to define aspirations about the learning experience that the University aims to provide, and the roles to be played in realizing these aspirations by students, instructors and the institution. A copy of the Learning Charter can be found at: [http://www.usask.ca/university\\_secretary/LearningCharter.pdf](http://www.usask.ca/university_secretary/LearningCharter.pdf) More information on University policies on course delivery, examinations and assessment of student

learning can be found at: <http://policies.usask.ca/policies/academic-affairs/academic-courses.php>

## Course Overview

The course consists of 75 minutes of lecture on the T/Th schedule, starting on Jan 5 2017 and ending on Apr 6 2017. This will result in 25 days of lectures during the term (approximately 31 hours of face-to-face instruction in the lectures). Twelve afternoons of hands-on lab exercises also included in this course. In these exercises, you will work in groups of five to perform anatomical dissections and work with preserved animal specimens. The laboratories are designed as a practical illustration of vertebrate anatomy and phylogeny, and are coordinated with lecture concepts as shown in the schedule below. The labs are where you will learn the language of vertebrate anatomy. Completion of the labs is a required course component. Note that the lab periods are scheduled for 3 hrs 50 minutes per afternoon; students need to make themselves available for this entire time period. Four lab exams spaced through out the course will test your learning of vertebrate anatomy. These exams are based on a spot test format where you will be given one minute to identify an anatomical structure or answer a short question. The lab tests are not comprehensive (ie they will each cover only the newest material learned in the lab), but the final lecture exam will integrate the laboratory material with the more general concepts taught in the lectures. In other words, you will be asked to answer a “concept” question using the language of anatomy. There is no midterm exam in this course.

## Class Schedule

<b>Week/ Dates</b>	<b>Major Lecture Topics</b> Textbook reading is underlined*	<b>Laboratory Activity</b> Dissection manual reading is underlined*
Week 1 Jan 5	Course Introduction, Morphological Concepts, Overview of Animal Phylogeny;	<i>No lab this week</i>
Week 2 Jan 10 Jan 12	Origin of the Vertebrates Embryological Concepts  <u>Textbook:</u> Chapters 1, 2 & 3	<i>Jan 11 or 12:</i> Examples of Deuterostome Diversity <u>Dissection manual:</u> Chapter 1 Supplementary Material
Week 3 Jan 17 Jan 19	Embryological Concepts  <u>Textbook:</u> Chapter 5	<i>Jan 18 or 19:</i> Vertebrate Embryology Protochordate Morphology <u>Dissection manual:</u> Chapters 1 & 2 Supplementary Material
Week 4 Jan 24 Jan 26	Phylogeny of the Skeletal System  <u>Textbook:</u> Chapters 7, 8 & 9	<i>Jan 25 or 26:</i> Agnathan Morphology Integument Anatomy Skeletal System Anatomy <u>Dissection manual:</u> Chapters 3, 4 & 5
Week 5 Jan 31 Feb 2	Phylogeny of the Skeletal System  <u>Textbook:</u> Chapters 7, 8 & 9	<i>Feb 1 or 2:</i> <b>Lab Exam #1 to end of Integument</b> Skeletal System Anatomy <u>Dissection manual:</u> Chapter 5

Week 6 Feb 7 Feb 9	Phylogeny of the Skeletal System Phylogeny of the Muscular System <u>Textbook:</u> Chapters 7, 8, 9 & 10	<i>Feb 8 or 9:</i> Skeletal System Anatomy <u>Dissection manual:</u> Chapter 5
Week 7 Feb 14 Feb 16	Phylogeny of the Muscular System <u>Textbook:</u> Chapter 10	<i>Feb 15 or 16:</i> <b>Lab Exam #2</b> on skeletal system Muscular System Anatomy <u>Dissection manual:</u> Chapter 6
Feb 20 to 24	<u>No Lectures – Midterm Break</u>	<u>No Lab – Midterm Break</u>
Week 8 Feb 28 Mar 2	Phylogeny of the Digestive System <u>Textbook:</u> Chapter 13	<i>Mar 1 or 2</i> Muscular System Anatomy <u>Dissection manual:</u> Chapter 6
Week 9 Mar 7 Mar 9	Phylogeny of the Digestive System Phylogeny of the Respiratory System <u>Textbook:</u> Chapter 11 & 13	<i>Mar 8 or 9:</i> Muscular System Anatomy <u>Dissection manual:</u> Chapter 6
Week 10 Mar 14 Mar 16	Phylogeny of the Respiratory System Phylogeny of the Circulatory System <u>Textbook:</u> Chapter 11 & 12	<i>Mar 15 or 16:</i> <b>Lab Exam #3</b> on muscular system Digestive Circulatory & Respiratory System Anatomy <u>Dissection manual:</u> Chapter 7 & 8
Week 11 Mar 21 Mar 23	Phylogeny of the Circulatory System Phylogeny of the Urogenital System <u>Textbook:</u> Chapter 11 & 14	<i>Mar 22 or 23:</i> Urogenital System Anatomy <u>Dissection manual:</u> Chapter 9
Week 12 Mar 28 Mar 30	Phylogeny of the Urogenital System Phylogeny of the Nervous & Sensory Systems; <u>Textbook:</u> Chapter 14, 16 & 17	<i>Mar 29 or 30:</i> Nervous & Sensory System Anatomy  <u>Dissection manual:</u> Chapter 10
Week 13 Apr 4 Apr 6	Phylogeny of the Nervous & Sensory Systems; Course wrap-up <u>Textbook:</u> Chapters 16 & 17	<i>Apr 5 or 6:</i> <b>Lab Exam #4</b> on the internal organ systems
	Final Exam during regular exam period (Apr 7 to 29)	

\* Additional readings may be assigned as the course proceeds. These will be noted during the lectures or in the lab manual as appropriate.

**Note:** Optional Lab Exam Review sessions will be arranged for the weekend and Tuesday evening before each lab exam. Specimens from the lab periods will be made available for study purposes during these review sessions.

## Instructors:

### Contact Information:

Dr Tracy Marchant coordinator	room 322 Biology bldg tracy.marchant@usask.ca	306-966-4420
Dr Doug Smith lab instructor	room 115 Biology dh.smith@usask.ca	306-966-4415
Ms Meagan Gilbert (lab instructor)	room 113 Geology meagan.gilbert@usask.ca	306-227-2424

**Office Hours:** Generally-speaking, the instructors above will be available in their offices on a drop-in basis. However, please note that all instructors have other commitments that may take them away from their office. Specific appointments can be set by email or through a phone call. Email responses to specific questions about course material are at the discretion of each instructor.

**Instructor Profiles & Other Information:** Drs Marchant is a regular faculty member/professor in the Department of Biology. She holds advanced degrees (MSc, PhD) and teaches and conducts research in the general area of animal physiology. Dr Smith also hold an advanced degree (PhD) and teaches in diverse subject areas in the Department of Biology including zoology and entomology. Ms Gilbert is a PhD candidate in Geology specializing in paleobiology.

## Required & Supplementary Resources

### Textbooks

Kardong, K. 2015. *Vertebrates. Comparative Anatomy Function Evolution*. McGraw Hill, 7<sup>th</sup> ed

Kardong, K & EJ Zalisko. 2015. *Comparative Vertebrate Anatomy – A Laboratory Dissection Guide*. 7<sup>th</sup> ed. ***This is the only lab manual for the course and must be purchased by each student.***

Both are available from the U of Saskatchewan Bookstore: <http://www.usask.ca/bookstore/>

### Electronic Resources & Recording Devices

You will be given access to a Refworks database of the primary literature maintained by Dr Marchant. Some of this material will be used in her lectures and you may find it useful to consult the original research article. The Refworks database links directly into the online journals held by the University of Saskatchewan Library. Other useful websites and electronic material will be added to the course Blackboard as appropriate. Recording devices are not permitted during the lectures, except when an accommodation is required as a result of registration with DSS (see below). Digital cameras may be used to photograph specimens used in the laboratory with the provision that such photographs are only shared amongst students in BIOL 361 and are not posted online, except as approved by Dr. Marchant.

### Downloads

These will be available as appropriate through the course Blackboard. You are required to download and read the course syllabus. Supplementary material (for the laboratories in particular) will also be posted on Blackboard for you. This material is designed to provide you with additional explanatory information. The other item that will be posted is a document called “Essential Vertebrate Phylogenies”. You are allowed to bring this document with you to the lab and final exams. Please note that Dr Marchant’s lecture slides are also provided to you as a courtesy. You are not required to download or print these slides. While she will endeavour to have slides posted sometime in advance of the lectures, this will not be guaranteed. These slides will not replace the lecture or lab experience and you are encouraged to attend all lectures and take your own notes.

## Supplementary Resources

Whenever possible supplementary material will be made available to you through the course Blackboard. A number of paper-based resources for the laboratory may be placed on reserve for you in the Natural Sciences Library; information will be provided to you as appropriate.

## Grading Scheme

Final Exam	55
Lab Exams (four)	45
Total	100%

Note that there is no midterm exam for this course.

## Evaluation of Student Performance

### Final Exam

Value: 55% of final grade  
 Date: Consult the Final Exam Schedule when it is released.  
 Length: 3 hours  
 Format: written answers, in the form of paragraphs or essays.

Description: The exam is comprehensive in that it will cover all lecture material and integrate the anatomy details learned in the laboratory. Students should plan to be in Saskatoon during the final exam period (Apr 11 to 30) as the final exam could be scheduled on any day during this period.

### Lab Exam #1

Value: 8% of final course grade  
 Date: Feb 1 or 2 at the beginning of the laboratory period  
 Length: 1 minute per question/24 questions  
 Format: spot test utilizing laboratory specimens/material

Description: Will include all of the laboratory material taught to date **except** the Skeletal System.

### Lab Exam #2

Value: 10% of final course grade  
 Date: February 15 or 16 at the beginning of the laboratory period  
 Length: 1 minute per question/30 questions  
 Format: spot test utilizing laboratory specimens/material

Description: Will include only the laboratory material dealing with the Skeletal System.

### Lab Exam #3

Value: 12% of final course grade  
 Date: March 15 or 16 at the beginning of the laboratory period  
 Length: 1 minute per question/36 questions  
 Format: spot test utilizing laboratory specimens/material

Description: Will include only the laboratory material dealing with the Muscular System.

### Lab Exam #4

Value: 15% of final course grade  
 Date: April 5 or 6 at the beginning of the laboratory period  
 Length: 1 minute per question/45 questions  
 Format: spot test utilizing laboratory specimens/material

Description: Will include only the laboratory material dealing with the internal organ Systems.

## Feedback to Students

Lab exams will be graded and returned by the next laboratory period. Students are advised to use these grades to determine the effectiveness of their study habits. Learning anatomy is like learning a new language. To do well, you must hear it, speak it and read it. All of which takes time, and a good work ethic.

## Missed Lab Exams/Extra Study Time/ Attendance Expectations

Students are expected to attend all scheduled lab periods. It is impossible to schedule make-up labs for this course. A student who does not write a lab exam and lacks a valid reason for missing the exam receive a grade of zero. When possible, specimens will be made available for students to study outside of the regular lab times, usually during the weekend and evenings immediately prior to the lab exam.

## Criteria That Must Be Met to Pass

Students must write the final exam in order to pass the course. Students who do not write the final exam will be assigned a final course grade of 49%, or lower depending on their performance in other aspects of the course, along with a grade comment of INF (Incomplete Failure). The final grade will be adjusted once a deferred final exam is written (see below).

## Lab and Final Examination Scheduling

All examinations must be written on the date scheduled. A student who is unable to write a lab exam through no fault of his or her own (ie for medical, compassionate or other valid reasons) must contact Dr. Marchant as soon as it is clear that the lab exam will be missed.

Documentation to substantiate the reason for the absence must be provided. The weighting assigned to the missed exam will be applied to the very next lab exam. Final course examinations may be scheduled at any time during the examination period (April 7 to 29); students should therefore avoid making prior travel, employment, or other commitments for this period. Students who miss the final exam for a valid reason must contact the College of Arts & Science and apply for a deferred final exam. Deferred exams may utilize a different format than the regular exam, at the sole discretion of Dr. Marchant. Students are encouraged to review all University examination policies and procedures: <http://policies.usask.ca/policies/academic-affairs/academic-courses.php>

## University of Saskatchewan Grading System

Students in BIOL 361 are reminded that the University has established a grading system to be used in all of its courses. Information on literal descriptors for grading at the University of Saskatchewan (reproduced below) can be found at:

<https://students.usask.ca/academics/grading/grading-system.php>

**Exceptional (90-100)** A superior performance with consistent evidence of

- a comprehensive, incisive grasp of the subject matter;
- an ability to make insightful critical evaluation of the material given;
- an exceptional capacity for original, creative and/or logical thinking;
- an excellent ability to organize, to analyze, to synthesize, to integrate ideas, and to express thoughts fluently.

**Excellent (80-90)** An excellent performance with strong evidence of

- a comprehensive grasp of the subject matter;
- an ability to make sound critical evaluation of the material given;
- a very good capacity for original, creative and/or logical thinking;
- an excellent ability to organize, to analyze, to synthesize, to integrate ideas, and to express thoughts fluently.

**Good (70-79)** A good performance with evidence of

- a substantial knowledge of the subject matter;
- a good understanding of the relevant issues and a good familiarity with the relevant literature and techniques;
- some capacity for original, creative and/or logical thinking;
- a good ability to organize, to analyze and to examine the subject material in a critical and constructive manner.

**Satisfactory (60-69)** A generally satisfactory and intellectually adequate performance with evidence of

- an acceptable basic grasp of the subject material;
- a fair understanding of the relevant issues;
- a general familiarity with the relevant literature and techniques;
- an ability to develop solutions to moderately difficult problems related to the subject material;
- a moderate ability to examine the material in a critical and analytical manner.

**Minimal Pass (50-59)** A barely acceptable performance with evidence of

- a familiarity with the subject material;
- some evidence that analytical skills have been developed;
- some understanding of relevant issues;
- some familiarity with the relevant literature and techniques;
- attempts to solve moderately difficult problems related to the subject material and to examine the material in a critical and analytical manner which are only partially successful.

**Failure <50** An unacceptable performance

### **Integrity Defined (from the Office of the University Secretary)**

The University of Saskatchewan is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the Student Conduct & Appeals section of the University Secretary Website and avoid any behavior that could potentially result in suspicions of cheating, plagiarism, misrepresentation of facts and/or participation in an offence. Academic dishonesty is a serious offence and can result in suspension or expulsion from the University. For more information on what academic integrity means for students see the Student Conduct & Appeals section of the University Secretary Website at:

<http://www.usask.ca/secretariat/index.php> All students should also read and be familiar with the Regulations on Academic Student Misconduct as well as the Standard of Student Conduct in Non-Academic Matters and Procedures for Resolution of Complaints and Appeals available on the University Secretary Website.

### **Examinations through Disability Services for Students (DSS)**

Students who have disabilities (learning, medical, physical, or mental health) are strongly encouraged to register with Disability Services for Students (DSS) if they have not already done so. Students who suspect they may have disabilities should contact DSS for advice and referrals. In order to access DSS programs and supports, students must follow DSS policy and procedures. For more information, check <https://students.usask.ca/health/centres/disability-services-for-students.php> or contact DSS at 966-7273 or [dss@usask.ca](mailto:dss@usask.ca).

Students registered with DSS may request alternative arrangements for examinations. Students must arrange such accommodations through DSS by the stated deadlines. Accommodation for the final exam must be made through regular DSS procedures. Students who are in need of accommodation for the lab exams must present the appropriate letter from DSS to Dr. Marchant. Students who require extra time or a quiet room must be prepared to make themselves available to write the lab exam on the morning prior to the regularly scheduled lab period.