COURSE SYLLABUS

COURSE TITLE:	**Mammal Diversity and Evolution**		
COURSE CODE:	CRN 20019	**TERM:**	Winter 2018
COURSE CREDITS:	3	**DELIVERY:**	Lecture & Practicum (Lab)
CLASS SECTION:	01	**START DATE:**	January 3, 2018
CLASS LOCATION:	Rm 125 Thompson (Biology) Building	**LAB LOCATION:**	Rm 123/124 Thompson Building
CLASS TIME:	MWF 9:30 – 10:20 am	**LAB TIME:**	L1 Th 1:30-5:20 pm
WEBSITE:	Via blackboard & main frame website		

Version 1, Dec 27, 2017, PDM

Instructor

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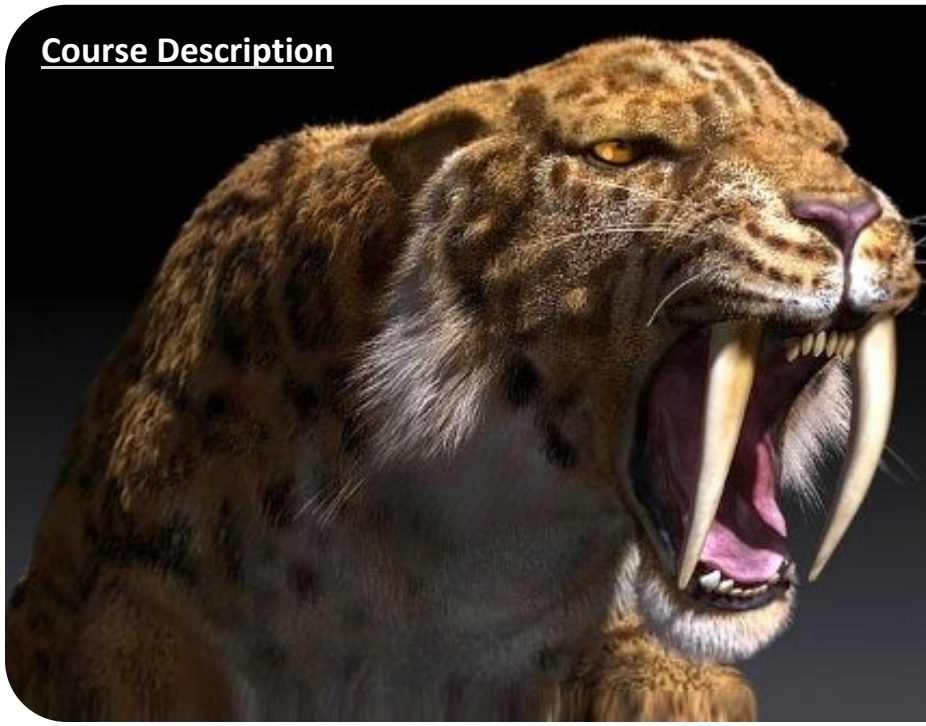
Office Hours: Appointments can be set up with instructors by email; however, most inquiries will be best answered with an email response. Responses to specific questions about course material are at the discretion of each instructor.

Course Description



This course is designed for undergraduate students specializing in biology with interest in the ecology and evolution of mammals. The course includes three lectures and one lab per week. The first portion of the course examines early evolution of the synapsid line and defining adaptations of the Class and its major lineages (Subclass, Infraclass). I then concentrate on more detailed evolution and ecology of mammalian orders and families (including extinct groups within living orders and families). My goal is to approach mammalogy in the context of adaptation; hence, rather than designing this course around a simple survey of extant orders (as is often done for a course in Mammalogy), I have structured the syllabus according to key adaptations found within and among mammal groups.

Prerequisites: BIOL 121 and 224 (or 203) and 228 (or 253); BIOL 302 (or 401) is recommended.

Learning Outcomes

Having successfully completed this course, you will appreciate the ecology and evolution of the major mammalian groups, be able to identify extant species to Order and Family (and some species to Genus and Species), understand the phylogenetic relationships between species of different groups, and have practiced writing a scientific review paper in the area of mammalian evolutionary history.

Winter 2018 Lecture Schedule

Week	Topic
Jan 3	Course introduction; Cladistics
Jan 8	Mammalian evolution and the fossil record; Geological time and plate tectonics in the context of mammalian evolutionary history; Origins of the Synapsida
Jan 15	Evolution of mammal-like reptiles to Class Mammalia; Prototheria
Jan 22	Metatheria; The marsupial-placental dichotomy; Introduction to Eutheria
Jan 29	Eutherian ecology and evolution in mammals since the K-T extinction event; Adaptations to insectivory and terrestrial carnivory
Feb 5	Terrestrial carnivory, cont.; Adaptations to life in water
Feb 12	Life in the water, cont.
Feb 15	**Midterm Exam During Lab Period**
Feb 19	**Midterm Break, No Classes**
Feb 26	Life in the air
March 5	The 'rodent' model
March 12	Large herbivores I
March 19	Large herbivores II
March 26	Primates
March 30	**Good Friday, No Classes**
April 2	Primates, cont.; Human evolution
TBA	**Final Exam**

Lecture Readings

Readings will be provided in class. Textbooks that I have used in developing lecture notes are available for short-term loan (4 hr) from the reserve collection of the Natural Sciences Library. These include:

Feldhamer, G.A., L.C. Drickamer, S.H. Vessey, and J.F. Merritt. 2004. Mammalogy: adaptation, diversity, and ecology. 2nd edition. McGraw-Hill, New York, NY. 576 pp.

Vaughan, T.A., J.M. Ryan, and N.J. Czaplewski. 2000. *Mammalogy.* 4th edition Harcourt, Fort Worth, TX. 566 pp.

Downloads and Supplementary Resources for the Lecture: These will be available as appropriate online (e.g., Blackboard or Main Frame websites). Please download and familiarize yourself with the course syllabus, and how to access course materials using PAWs and your NSID login. Please note that instructor's PowerPoint slides may be provided to you as a courtesy. You are not required to download or print these slides. While I will endeavor to have the lecture PowerPoint slides posted sometime in advance of the lectures, and the online supplementary notes on which I base these slides (in chapter format), I will not guarantee this. Slides and supplementary material will not replace the lecture or lab experience and you are encouraged to attend all lectures and take your own notes.

Lab Readings (Required Text)

Martin, R.E., R. Pine, and A.F. DeBlase. 2011. A Manual of Mammalogy: with Keys to Families of the World, Third Edition. Waveland Press, reissued Nov 30, 2011 - Science - 333 pp.

*This book is out of print as a hard copy; however, the manual is available for purchase as a Google eBook, a re-issue of the 3rd edition (2001 hard copy McGraw-Hill) by Waveland Press. Hard copies are still available from various bookstores online (e.g., Amazon); however, it may be easiest for you to purchase the ebook for approx. $30 CAD (as of December 17, 2017) at:
http://books.google.ca/books?id=kQEZAAAAQBAJ&dq=manual+of+mammalogy&source=gbs_navlinks_s

Lab Component

The laboratory is designed to present information on mammal biology not covered in detail in the lecture, promote your appreciation of diversity within Mammalia using specimens housed in the Biology Department's extensive Museum collection, and complement material presented in the lecture on mammalian ecology and evolution. The first five labs include assignments which will not be graded, and thus are not mandatory; however, completing the assignments is highly recommended for proper preparation for the final lab exam. Labs in the latter half of the course are designed for you to practice identifying specimens of the different mammalian orders discussed in the lecture. There will be no assignments associated with these latter labs. A cumulative lab practical exam worth 30% of your final grade is scheduled for the end of the term (there is no lab midterm exam). This exam will test you on aspects of material presented in the first half of the lab, your ability to identify specimens to Order, Family, Genus or Species, and any special adaptations of those specimens. In place of weekly assignments in the lab, a term paper in the area of mammalian evolution will be assigned as an additional component of the lab portion of the course (15% of your final grade). Topics for the term paper will be discussed by your lab instructors early in the semester.

Winter 2018 Lab Schedule

Lab	Topic	Lab Manual Chapters
January 11	General characteristics of mammals Diagnostic characteristics; handling of specimens Skulls and teeth Identifying basic cranial features; obtaining cranial measurements; anatomy of teeth; types of teeth and their functions; understanding dental formulae	1, 2 and 3

January 18	The Integument, Horns and Antlers Histology of mammalian skin and hair; hair types and coloration patterns; anatomy of horns and antlers	4 and 5
January 25	Limbs and Locomotion Anatomy of claws, nails, and hooves; appendicular skeletal anatomy; limb adaptations for different modes of locomotion Reproduction	6 and 7
February 1	**Outline for Term Paper Due** Identifying Monotremes, Marsupials, Insectivores, Colugos, Bats	10–14
February 8	Identifying Primates, Tupaiids, Xenarthrans, Pangolins, Carnivores	15–19
February 15	**MIDTERM EXAM DURING LAB PERIOD**	
March 1	Identifying Whales, Macroscelideans, Rodents, Lagomorphs	20– 23
March 8	Identifying Tubulidentata, Subungulates, Perissodactyla, Artiodactyla	24– 27
March 15	Review lab (limited specimens available)	
March 29	**Practical Lab Exam** (emphasizing identification of species)	
April 6	**Term paper due last day of Winter T2 classes**	

Lab Attendance and Lab Final Examination Scheduling

Senior students are expected to make mature decisions about their attendance at labs. Attendance will not be taken; however, past experience has shown us that absences reflect in performance on the final lab exam. Setting up the labs for this course is time intensive: specimens must be carefully removed from the museum and displayed under supervision. **Course organizers will not retrieve demonstration materials of missed labs for absent students.** That said, if absences are for a University approved reason (e.g., illness, death in the family, official University business) and course organisers are given the appropriate documentation (required in all circumstances), arrangements to help students meet the course requirements can be made. The latter will also apply to ESS scheduling of the lab final exam.

Midterm and Final Examination Scheduling

Midterm and final examinations must be written on the date scheduled. Final examinations may be scheduled at any time during the examination period which commences after April 6 (last day of classes) to the end of the month; students should therefore avoid making prior travel, employment, or other commitments for this period. If a student is unable to write an exam through no fault of his or her own for medical or other valid reasons, documentation must be provided **WITHIN THREE WORKING DAYS** and an opportunity to write the missed exam may be given. Students are encouraged to review all examination policies and procedures: http://www.usask.ca/calendar/exams&grades/examregs/

Please note, final exams are rescheduled ONLY with a fee and by application to your College, following University-approved procedures.

Course Grading Scheme

Mid-term exam	20%
Final exam	35%
Laboratory final exam	30%
Term paper	15%
Total	100%

Detailed Grading Components

Midterm Exam

Value: 20% of final grade
Date: February 15, Rooms Biology 123/124, 1:30 PM
Length: 120 minutes
Type: Short answer and essay
Resources: No notes, cell phones, or smart phones or other digital devices are allowed.

Term Paper

Value: 15% of final grade
Date: Due date April 6, 2018
Length: Minimum 15 double-spaced pages, plus references
Type: Discussed in lab

Final Lab Exam

Value: 35% of final grade
Date: March 29, Rooms Biology 123/124, 1:30 PM
Length: Set time based on specimens
Type: Short answer, emphasizing identification of species and adaptations
Resources: No notes, cell phones, or smart phones or other digital devices are allowed.

Final Lecture Exam

Value: 30% of final grade
Date: Consult Final Exam Schedule
Length: 3 hours
Type: Short answer and essay
Resources: No notes, cell phones, or smart phones or other digital devices are allowed.

A Special Note Regarding the Final Exam: The Final Exam will be a cumulative exam, with emphasis (80% of questions) on material delivered after the midterm exam.

Criteria That Must Be Met to Pass the Course

An overall course grade of 50% must be obtained to pass this course.

Grading Outcomes

Information on literal descriptors for grading at the University of Saskatchewan can be found below, and at: https://students.usask.ca/academics/grading/grading-system.php

Please note: There are different literal descriptors for undergraduate and graduate students. More information on the Academic Courses Policy on course delivery, examinations and assessment of student learning can be found at: http://www.usask.ca/university_secretary/council/academiccourses.php

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

University of Saskatchewan Grading System (for undergraduate courses)

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.

All students should read and be familiar with the Regulations on Academic Student Misconduct (http://www.usask.ca/university_secretary/honesty/StudentAcademicMisconduct.pdf) as well as the Standard of Student Conduct in Non-Academic Matters and Procedures for Resolution of Complaints and Appeals (http://www.usask.ca/university_secretary/honesty/StudentNon-AcademicMisconduct2012.pdf)

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/university_secretary/pdf/dishonesty_info_sheet.pdf

Examinations with Access and Equity Services (AES)

Students who have disabilities (learning, medical, physical, or mental health) or other grounds for requiring specific accommodations including dates, places, and timings of exams (e.g., religious grounds) are strongly encouraged to register with Access and Equity Services (AES), if they have not already done so. Students who suspect they may have disabilities should contact AES for advice and referrals. In order to access AES programs and supports, students must follow AES policy and procedures. For more information, check https://students.usask.ca/health/aes/accommodations.php

Students registered with AES may request alternative arrangements for mid-term and final examinations.

Students must arrange such accommodations through AES by the stated deadlines. Instructors shall provide the examinations for students who are being accommodated by the deadlines established by AES.