

UNIVERSITY OF CALGARY FACULTY OF SCIENCE DEPARTMENT OF BIOLOGICAL SCIENCES COURSE OUTLINE

1. Course: ZOOLOGY 571 – PALAEOBIOLOGY OF VERTEBRATES

Lecture Sections:	L01	MWF	0900-0950	ST	063 Winter 201	8
Labs:	B02	W	1600-1750	BI	044	
Course Coordinator/ Instructor:	Dr. Jessica The	odor	210-9818	BI 353	jtheodor@ucalgary.ca	ι

D2L: <u>ZOOL 571 L01 - (WINTER 2018) – PALAEBIOLOGY OF VERTEBRATES (W18ZOOL571L01)</u>

Biological Sciences Department BI 186; (403) 220-3140; biosci@ucalgary.ca

2. **Prerequisites:** Zoology 377, 379 or 403. See section 3.5.C in the Faculty of Science section of the online Calendar (<u>http://www.ucalgary.ca/pubs/calendar/current/sc-3-5.html</u>)

Antirequisite(s): Credit for Zoology 571 and either Zoology 571.01 or 571.02 will not be allowed.

3. Grading: The University policy on grading and related matters is described in "Academic Regulations, sections F.1 and F.2" of the online University Calendar (<u>http://www.ucalgary.ca/pubs/calendar/current/f-1.html</u> and <u>http://www.ucalgary.ca/pubs/calendar/current/f-2.html</u>) In determining the overall grade in the course the following weights will be used:

Midterm Examination	20%	In Class Feb. 16, 2018
Term Paper	20%	
Peer review of term papers	10%	
Leading discussion	5%	
Discussion Participation	15%	
Final Examination	30%	

There will be a final examination scheduled by the Registrar.

Letter Grade	A+	А	A-	B+	В	B-	C+	С	C-	D+	D
Min. Percent Required	93	83	80	77	73	70	68	63	60	55	50

- 4. Missed components of term work: The regulations of the Faculty of Science pertaining to this matter are found in the Faculty of Science area of the Calendar in section 3.6: <u>http://www.ucalgary.ca/pubs/calendar/current/sc-3-6.html</u>. It is the student's responsibility to familiarize himself/herself with these regulations. See also <u>http://www.ucalgary.ca/pubs/calendar/current/e-3.html</u>
- 5. Scheduled out-of-class activities: Dates and times of class exercises held outside of class hours: Optional field trip, TBA.

REGULARLY SCHEDULED CLASSES HAVE PRECEDENCE OVER ANY OUT-OF-CLASS-TIME-ACTIVITY.

Required:Vertebrate Palaeontology, 4th.ed. Wiley.
M. J. Benton.Recommended:Patterns and Processes of Vertebrate Evolution. Cambridge University Press:
Cambridge 1997. R.L. Carroll.
Endless Forms Most Beautiful: the new science of Evo Devo, W. W. Norton
& Co.: New York 2005. S. B. Carroll.
Major transitions in vertebrate Evolution, 1st Ed., Indiana University Press:
2007. Anderson, J & Hans-Dieter Sues.

- 6. Online course components: Readings for weekly discussions will be posted on D2L. Students are expected to read the these readings before Lab section, and come to Lab prepared to discuss the papers. Once in the term, each student will be scheduled to lead the discussion. D2L will also be used for submission of the term paper assignment.
- 7. Examination policy: No electronic or written aids (e.g. cell phones, tablets, computers, PDAs, notes, textbooks) will be allowed during writing of any exams. Non-programmable calculators will be permitted to answer quantitative questions on exams, if applicable, and permission to do this will be clearly indicated on the examination paper. Students should also read the Calendar, Section G, on Examinations: http://www.ucalgary.ca/pubs/calendar/current/g.html.
- 8. Writing across the curriculum statement: In this course, the quality of the student's writing in various written components will be a factor in the evaluation of those components. See also <u>http://www.ucalgary.ca/pubs/calendar/current/e-2.html</u>

9. ETHICS IN THE BIOLOGICAL SCIENCES

TEXTS:

Studies in the Biological Sciences involve the use of living and dead organisms. Students taking laboratory- and field-based courses in these disciplines can expect involvement with and experimentation on such materials. Students perform dissections on dead or preserved organisms in some courses. In particular courses, students experiment on living organisms, their tissues, cells, or molecules. Sometimes field work requires students to collect a variety of living materials by many methods, including humane trapping.

All work on humans and other animals conforms to the Helsinki Declaration and to the regulations of the Canadian Council on Animal Care. The Department strives for the highest ethical standards consistent with stewardship of the environment for organisms whose use is not governed by statutory authority. Individuals contemplating taking courses or majoring in one of the fields of study offered by the Department of Biological Sciences should ensure that they have fully considered these issues before enrolling. Students are advised to discuss any concern they might have with the Undergraduate Program Director of the Department.

- 10. Human studies statement: If you agree, your course work may be used for research purposes. Your responses will remain anonymous and confidential. Grouped data (no individual responses) may be used in academic presentations and publications. Participation in such research is voluntary and will not influence grades in this course. Students' signed consent forms will be withheld from instructors until after final grades are submitted. More information will be provided at the time student participation is requested. See also Section E.5 of the University Calendar.
- 11. Lab photographic device policy: No photography will be permitted in the lab section of this course. If you violate this policy, your device will be confiscated until the end of the lab period. Repeated abuse may result in a charge of misconduct.

12. OTHER IMPORTANT INFORMATION FOR STUDENTS:

- (a) Misconduct: Academic misconduct (cheating, plagiarism, or any other form) is a very serious offence that will be dealt with rigorously in all cases. A single offence may lead to disciplinary probation or suspension or expulsion. The Faculty of Science follows a zero tolerance policy regarding dishonesty. Please read the sections of the University Calendar under Section K. Student Misconduct to inform yourself of definitions, processes and penalties.
- (b) Assembly Points: In case of emergency during class time, be sure to FAMILIARIZE YOURSELF with the information on <u>assembly points</u>.
- (c) Student Accommodations: Students needing an Accommodation because of a Disability or medical condition should contact Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities available at <u>http://www.ucalgary.ca/policies/files/policies/procedure-for-accommodations-for-students-withdisabilities 0.pdf</u>.

Students needing an Accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a Protected Ground other than Disability, should communicate this need, preferably in writing, to the Associate Head of Biological Sciences, Dr. H. Addy by email addy@ucalgary.ca or phone 403 220-3140.

- (d) Safewalk: Campus Security will escort individuals day or night (<u>http://www.ucalgary.ca/security/safewalk/</u>). Call 220-5333 for assistance. Use any campus phone, emergency phone or the yellow phones located at most parking lot pay booths.
- (e) Freedom of Information and Privacy: This course is conducted in accordance with the Freedom of Information and Protection of Privacy Act (FOIPP). As one consequence, students should identify themselves on all written work by placing their name on the front page and their ID number on each subsequent page. For more information see also http://www.ucalgary.ca/secretariat/privacy.
- (f) Student Union Information: VP Academic Phone: 403 220-3911 Email: <u>suvpaca@ucalgary.ca</u> SU Faculty Rep. Phone: 403 220-3913 Email: <u>science1@su.ucalgary.ca</u>, <u>science2@su.ucalgary.ca</u> and <u>science3@su.ucalgary.ca</u>; Student Ombuds Office: 403 220-6420 Email: <u>ombuds@ucalgary.ca</u>; <u>http://ucalgary.ca/provost/students/ombuds</u>
- (g) Internet and Electronic Device Information: You can assume that in all classes that you attend, your cell phone should be turned off unless instructed otherwise. Also, communication with other individuals, via laptop computers, Blackberries or other devices connectable to the Internet is not allowed in class time unless specifically permitted by the instructor. If you violate this policy you may be asked to leave the classroom. Repeated abuse may result in a charge of misconduct.
- (h) U.S.R.I.: At the University of Calgary, feedback provided by students through the Universal Student Ratings of Instruction (USRI) survey provides valuable information to help with evaluating instruction, enhancing learning and teaching, and selecting courses (www.ucalgary.ca/usri). Your responses make a difference please participate in USRI Surveys.

Department Approval:	ORIGINAL SIGNED	Date:
Z401 co W18; 07/12/2017 2:27	PM	

COURSE OUTCOMES

In this course we will survey the fossil record of the vertebrate groups to examine their morphology and known diversity of different groups through time, understand major trends in their evolution, and major changes in their environments through geologi c time. We will use both palaeontological and neontological information to understand evolutionary trends. We will also examine the ways in which palaeontological information may be used to interpret vertebrate evolution and in systematics. We will be broadening our approach by examining certain ideas in more detail and, in the process, discovering how palaeontologists work, what information is important to them from the perspectives of neontology and palaeontology, and how information from disparate fields is brought together to help answer complex evolutionary problems.

Discussions:

The days for which discussions are scheduled are marked on the schedule. Papers will be assigned from the links posted on the course D2L site for you to access online (and print, if you wish). The class members will each be responsible for preparing and leading the discussion and exploration one week, which will be scheduled in week 1. It is the responsibility of each student to participate fully. It is the responsibility of all class members to fully appraise the assigned readings for discussion sessions, and to come prepared with questions to ask and discuss.

The discussions are meant to enhance your understanding of palaeobiology, so feel free to raise questions about concepts and ideas that you do not understand, or which require further explanation, as well as questions about why particular points raised by Benton or the other readings have been brought forward. You should take the opportunity to consult these primary sources to enhance your understanding of the material. I encourage you to discuss the readings collectively before class and to devise approaches to questions that will work to enhance the group's understanding.

ZOOLOGY 571		WINTER 2018 SCHEDULE
January	08 10	Introduction to the course; The fossil record: geologic time and fossilization Origin of bone and cartilage Discussion: expectations, Term paper assignment will be handed out; no reading for
	12	this week Agnatha and the origin of jaws
	15 17 19	Early diversification of gnathostomes Origin of paired fins Cartilaginous 'fishes'
	22 24 26 29 31	Actinopterygians and sarcopterygians Teleostei Origin of limbs and transition to land Evolution of the impedance matching ear Early tetrapods and the origin of Lissamphibia
February	02	Lepospondyli and Temnospondyli TERM PAPER TOPIC DUE
	05 07 09	Origin of Amniota Origin and radiation of Synapsida Acquisition of 'mammalian' features and the origin of Mammalia
	12 14 16	Multituberculates and monotremes Marsupial evolution MIDTERM EXAM (IN CLASS)
	19-23	READING WEEK
	26	Placentals 1: Euarchontoglires (bats, rodents and primates) TERM PAPER PROGRESS REPORT DUE Placentals 2: A fratheria
March	02	Placentals 3: Laurasiatheria
	05 07 09	Placentals 4: Hell on hooves Placentals 5: Back to the water again: whales and others Placentals 6: South American mammals
	12 14 16	The Great American Biotic Interchange Pleistocene extinctions Origin and radiation of turtles
	19 21 23	Lepidosauria Origin of snakes Back to the water 1: marine reptiles TERM PAPER DUE
	26 28 30	Archosauromorpha: phylogeny and basal forms Crurotarsi: crocodiles and much more GOOD FRIDAY - NO CLASS
April	02	Ornithodira: pterosaurs and basal dinosaurs PEER REVIEWS DUE
	04 06	Dinosauria: phylogeny Ornithischia: bird-hipped dinosaurs
	11	Saurischia 2: theropods
	13	Origin of birds and flight REVISED TERM PAPER DUE

Term Paper

For the term paper you will select a major "event" in the evolution of the vertebrates, either the origin of a major new group with a new adaptation (tetrapods, whales) or a major new ecological niche (herbivory, flight) and document it, using evidence from palaeontology and neontology to produce an integrative synthesis, as in a professional review paper. You will be required to peer review other students papers and give feedback; you will also have the opportunity to revise your paper in response to feedback from the other students. The following guidelines apply:

- (a) Selection of a topic and submission for approval by **February 02, 2018**
- (b) Submission of an interim report outlining progress to date and literature consulted/requested on **February 26, 2018.**

Submission of the term paper on March 23, 2018

Peer reviews due April 02, 2018

Final revised paper due April 13, 2018