

University of Alberta
Mass Extinctions and Dinosaurs
EAS 207
Fall 2021, Section A1
MWF 1:00-:150pm

Instructor: Dr. Michael W. Caldwell; mw.caldwell@ualberta.ca
Office: Z 424, Zoology Tower, 4th Floor, Biological Sciences Building

Email Communications: Please include your full name or what you like to be called, and your student ID in each email. As the lecture material for the course will be delivered and communicated electronically, it is critical that the teaching assistant and I know who you are so we can communicate with you as effectively as possible.

Teaching Assistant (TA): Kelly Rozanitis <rozaniti@ualberta.ca>

Course website: *eClass*

COVID-19 PANDEMIC DISCLAIMER

University and public health policies and regulations are likely to change several times during the Fall 2021 term. These evolving regulations and policies take precedence over anything published in this syllabus. The instructor will notify students of any pertinent changes by email and in class, but students are ultimately responsible for keeping aware of new and evolving University regulations.

Distance Learning Modifications specific to EAS 207 for 2021

Lectures (asynchronous learning): Normally, this course would be lectured in person on MWF from 1:00-1:50 pm. However, the lecture materials will be delivered on-line, through pre-recorded, asynchronous lectures (PowerPoint slides, professor presenting the lecture, and additional multimedia as required) available on *eClass*. For each lecture date, there will be several lecture segments of 15-30 minutes each for a total of 50 lecture minutes/lecture, to be viewed by students on their own schedule (for a total of 150 lecture minutes/week). The regular PowerPoint version of each full lecture will also be posted on *eClass* for student review.

Lecture Discussions (synchronous and asynchronous learning): To supplement the recorded lectures and PowerPoint slide lectures available on *eClass*, discussions will be held with the Professor and TA via *eClass Zoom* from 1:30-1:50 pm MWF. These will be recorded and posted to *eClass* for all students to view.

Office Hours/Additional Contact Time with Professor: please use the *EClass* Forum to ask questions, or to schedule a group discussion with either the professor and/or teaching assistant. Email is also perfectly fine if your issue is more personal or you wish the conversation to be private. You are also welcome to come for an in person meeting at the office of the professor.

The *eClass* Forum is great though, particularly as the Q&A could potentially address issues for more than just one person. The TA and I are open for a reasonable number of unscheduled *Zoom* discussions as an alternative to setting online distance-office hours (I am anticipating *Zoom* conversations at your request of approximately 3 hours total per week, similar to set office hours).

COURSE CONTENT

Course Description: ★ 3 (fi 6) (first term, 3-0-0) Mass extinctions that have affected the biosphere and their possible causes. Overview of vertebrate evolution. Classification, behaviour, and ecology of dinosaurs. Origins of birds and mammals. Prerequisite: Any 100-level Science course. [Faculty of Science]

Course Objectives and Expected Learning Outcomes: By the end of this course, you should be able to:

- 1) Reproduce the Geologic Time Scale, down to the level of Period. You should be able to place all subsequent topics in the context of the Geologic Time Scale.
- 2) Explain in broad terms how cladistics is applied to taxonomy and phylogeny, with reference to particular groups we discuss in class.
- 3) Briefly explain the major ideas and contributions made by certain scientists to our understanding of evolution and extinction.
- 4) Explain the major developments in the evolution of vertebrates, from bony fishes to amphibians to reptiles, leading to dinosaurs, noting essential/distinguishing characteristics of the groups we highlight in the course.
- 5) Name and characterize all the major groups of dinosaurs, their interrelationships and general temporal ranges.
- 6) Describe the origin and development of flight and the morphological characteristics associated with flight, especially as exemplified by pterosaurs and birds.
- 7) Explain the origin of mammals from mammal-like reptiles, and the major developments in mammals as a group. This includes the influence of plate tectonics on mammal evolution.
- 8) Explain what a mass extinction is and how it is recognized in the fossil record and evaluate certain events in the fossil record to see if they qualify as such.
- 9) For each of the mass extinctions or extinction events we discuss, you should be able to enumerate the victims, describe the plate tectonic/geographic/climate setting of the time, and also explain and evaluate the various mechanisms invoked to explain each of the extinctions.

Lecture Schedule, and Suggested Textbook Readings (Benton, 4th Edition)

DATE	D	#	TOPIC	RECOMMENDED TEXTBOOK READINGS
SEPT 1	W	LECT. 1	AN INTRODUCTION TO PALAEOLOGY AND GEOLOGY	CHAPTER 2
SEPT 3	F	LECT. 2	BASICS OF EVOLUTIONARY BIOLOGY AND SYSTEMATICS	CHAPTER 2
SEPT 6	M		LABOUR DAY HOLIDAY	
SEPT 8	W	LECT. 3	THE SCIENCE OF VERTEBRATE PALAEOLOGY	CHAPTER 2
SEPT 10	F	LECT. 4	MASS EXTINCTIONS – WHAT ARE THEY?	
SEPT 13	M	LECT. 5	MASS EXTINCTIONS PRECAMBRIAN TO EARLY PALAEOZOIC (END PRECAMBRIAN, LATE ORDOVICIAN, LATE DEVONIAN)	
SEPT 15	W	LECT. 6	CAMBRIAN EXPLOSION – CHORDATE AND VERTEBRATE ORIGINS	CHAPTER 1; 3.1
SEPT 17	F	LECT. 7	DEVONIAN RADIATION AND ORIGIN OF TETRAPODS	CHAPTER 3; 4; 5
SEPT 20	M		MIDTERM EXAMINATION 1	
SEPT 22	W	LECT. 8	MASS EXTINCTIONS MID TO LATE PALAEOZOIC (END-PERMIAN [PERMO-TRIASSIC])	CHAPTER 5.7; 6.1, 6.5
SEPT 24	F	LECT. 9	PERMO-TRIASSIC EXTINCTION – THE RISE OF REPTILES	CHAPTER 5; 6
SEPT 27	M	LECT. 10	THE FIRST DINOSAURS - 1	CHAPTER 6.4; 8
SEPT 29	W	LECT. 11	THE FIRST DINOSAURS - 2	CHAPTER 8
OCT 1	F	LECT. 12	TURTLES AND CROCODILES	CHAPTER 8.7, 8.8
OCT 4	M	LECT. 13	MARINE REPTILES – THE ORIGINS OF SEA DRAGONS	CHAPTER 6.2
OCT 6	W	LECT. 14	THE RISE OF MAMMALS	CHAPTER 10
OCT 8	F	LECT. 15	THE RISE OF MAMMALS	CHAPTER 10
OCT 11	M		THANKSGIVING HOLIDAY	
OCT 13	W		MIDTERM EXAMINATION 2	
OCT 15	F	LECT. 16	MASS EXTINCTIONS MESOZOIC (TRIASSIC-JURASSIC EVENT; CENOMANIAN-TURONIAN BOUNDARY EVENT; K-PG EVENT)	
OCT 18	M	LECT. 17	DINOSAURS - 1	CHAPTER 8
OCT 20	M	LECT. 18	DINOSAURS - 2	CHAPTER 8
OCT 22	F	LECT. 19	DINOSAURS – 3/ORIGINS OF FLIGHT	CHAPTER 8; 9
OCT 25	M	LECT. 19	DINOSAURS – 3/ORIGINS OF FLIGHT	CHAPTER 8; 9
OCT 27	W	LECT. 20	MARINE REPTILES - 3	CHAPTER 8.10
OCT 29	F	LECT. 21	MARINE REPTILES - 4	CHAPTER 8.10
NOV 1	M	LECT. 22	THE RADIATION OF MAMMALS	CHAPTER 10.4
NOV 3	W	LECT. 23	THE END CRETACEOUS EXTINCTION EVENT - 1	
NOV 5	F		MIDTERM EXAMINATION 3	
NOV 9-13	M	N/A	READING WEEK BREAK	
NOV 15	M	LECT. 24	EXTINCTIONS CENOZOIC – PALAEOCENE-EOCENE BOUNDARY	
NOV 17	W	LECT. 25	EXTINCTIONS CENOZOIC – EOCENE-OLIGOCENE & MIOCENE EVENTS	CHAPTER 10
NOV 19	F	LECT. 26	THE WORLD BELONGS TO MAMMALS – CARNIVORES	CHAPTER 10.10
NOV 22	M	LECT. 27	THE WORLD BELONGS TO MAMMALS – HERBIVORES	
NOV 24	W	LECT. 28	THE ORIGIN AND EVOLUTION OF WHALES	
NOV 26	F	LECT. 29	PLIOCENE EXTINCTIONS AND THE GREAT BIOTIC INTERCHANGE	CHAPTER 10.14
NOV 29	M	LECT. 30	QUATERNARY EXTINCTION EVENT AND THE ICE AGE	CHAPTER 10.14
DEC 1	W	LECT. 31	THE HOLOCENE AND NOW, THE ANTHROPOCENE?	
DEC 3	F		COURSE REVIEW	
DEC 6	M		COURSE REVIEW	
DEC 14	M		FINAL EXAM	

LEARNING RESOURCES

Recommended Textbook: Benton, Michael, J. 2014. *Vertebrate Palaeontology*. 4th Edition. Wiley-Blackwell. Pp. 480. ISBN: 978-1-118-40755-4

An e-copy of this textbook can be downloaded from the UofA Library for free for a two-week period of time. The UofA Library holds a license on this e-copy for “Unlimited Concurrent Users” as supported by Ebook Central Academic Complete. You will need to download to your PC, a software program called “Adobe Digital Editions 4.5” in order to download and read the textbook. You may borrow the textbook multiple times throughout the term. Alternatively, when you wish to read recommended chapters, you may also read it Online through the UofA Library system and Ebook Central. You can of course purchase a hard copy of the textbook through Amazon, etc., currently priced CDN \$108.37 for paperback.

Recommended or Optional Learning Resources: provided on *eClass*.

GRADE EVALUATION

The University of Alberta uses a letter grading system with a four-point scale of numerical equivalents for calculating grade point averages. An important feature of this grading system is that marking and grading are done separately. Exams will be evaluated and expressed in raw marks throughout the course. Raw marks achieved in the various exams and assignments over the entire term will be used to calculate a term summary mark (final mark), after all components have been marked. The term summary mark will then be used to assign a final letter grade, based on natural breaks in the distribution of term summary marks for the class. The letter grade assigned is based on a combination of absolute achievement and relative performance in this class, incorporating historic distribution and natural breaks in the class distribution of total scores, but is not based on a curve of student grades.

Grades are unofficial until approved by the Department and/or Faculty offering the course.

More information concerning University of Alberta Assessment and Grading Policies are available online at <https://policiesonline.ualberta.ca/PoliciesProcedures/Policies/Assessment-and-Grading-Policy.pdf>

Examinations:

COMPONENT	WEIGHT	DATE & TIME
Midterm #1	20%	20th September, 1-1:50pm
Midterm #2	20%	13th October 1-1:50pm
Midterm #3	20%	5th November 1-1:50pm
*Final Exam	40%	14th December 2:00pm

*WARNING: Students must verify this date on BearTracks when the Final Exam Schedule is posted. FYI: The final exam planner is found on the Registrar’s website.

Exams and Examination Format: There will be four examinations – 3 midterm examinations and one final, comprehensive examination. All questions will be drawn from the lecture materials inclusive of recommended readings from the recommended textbook and readings posted on *eClass*. Exams will be written online using the *eClass* system. Good study habits are essential to success on these examinations, all of which will be drawn from my lectures and your discussions with me and with the Teaching Assistant.

POLICIES FOR LATE AND MISSED WORK

Missed Term Exams: For an excused absence where the cause is religious belief, a student must contact the instructor(s) within two weeks of the start of Winter classes to request accommodation for the term (including the final exam, where relevant). I *may* request adequate documentation to substantiate request.

A student who cannot write a term examination or complete a term assignment due to incapacitating illness, severe domestic affliction or other compelling reasons must contact the instructor within two working days, i.e., 48 hours, following the missed exam or assignment (or as soon as the student is able). Email is the preferred mode of communication, if possible. You *may* be required to provide a signed Departmental Declaration to the instructor of course. Each case will be considered on an individual basis. There are three possible decisions that can be made when an examination/assessment is missed: (1) denied, with a score of zero awarded for the missed assessment, (2) deferred assessment with the weight of the missed assessment added to the final exam, or (3) extension of due date for the missed assessment.

Please remember that it is a privilege, not a right, to have the opportunity to make up missed assessments. Misrepresentation of facts to gain a deferral is a serious breach of the *Code of Student Behaviour*.

If you do not seek or are not granted an excused absence, the final mark will be calculated using a raw score of zero for the missed assessment.

FYI: Deferral of term work to the final exam will increase the weight of the exam but does not change the ‘syllabus weight’ of the exam and does not qualify you for reexamination.

Deferred Final Examination: A student who cannot write the final examination due to incapacitating illness, severe domestic affliction or other compelling reasons can apply for a deferred final examination. Students who failed at the start of term to request exam accommodations for religious beliefs are expected to follow the normal deferred final examination process. Such an application must be made to the student’s Faculty office within two working days of the missed examination and must be supported by appropriate documentation or a Statutory Declaration (<http://calendar.ualberta.ca/content.php?catoid=28&navoid=6961#Attendance>). Deferred examinations are a privilege and not a right; there is no guarantee that a deferred examination will be granted. Misrepresentation of Facts to gain a deferred examination is a serious breach of the *Code of Student Behaviour*.

If it is necessary to hold a **deferred final examination**, this exam will be held at **January 15th, 2021**.

Re-evaluation of Exams. Please make sure that marks on exams have been added correctly, and if not, please inform the instructor so that I may verify the error and correct the grade accordingly. If you feel that a question has been graded incorrectly, you may request that a question be re-graded, but you should understand that I will look at the whole exam, not just a single question. As such, your overall mark may increase or decrease, since the instructor may remove unwarranted marks as well as add marks that have been missed.

REMOTE DELIVERY CONSIDERATIONS

Technology for Remote Learning: To successfully participate in remote learning in this course, it is recommended that students have access to a computer with an internet connection that can support the tools and technologies the University uses to deliver content, engage with instructors, TAs, and fellow students, and facilitate assessment and examinations. Please refer to [Technology for Remote Learning - For Students](#) for details. If you encounter difficulty meeting the technology recommendations, please email the Dean of Students Office (dosdean@ualberta.ca) directly to explore options and support.

Please contact the instructor by the add/drop deadline (September 15th, 2020) if you do not have access to the minimum technology recommended. The instructor will make arrangements, through consultation with the Associate Chair Undergraduates, for accommodating students who contact the instructor before this date. Failure to do so may result in a zero in any assessment that depends on the minimum technology.

Recordings of Synchronous Activities: Should we be required to move to an online learning format, please note that in-class time discussions for this course will be recorded and posted to *eClass*. Recordings of this course will be used for the purposes of student learning and will be disclosed to other students enrolled in this section of the class, and to the Teaching Assistant. Students have the right to not participate in the recording and are advised to turn off their cameras and audio prior to recording; they can still participate through text-based chat. It is recommended that students remove all identifiable and personal belongings from the space in which they will be participating. Recordings will be made available until the end of term, Dec. 30, 2020, at which time they will be deleted. Please direct any questions about these recordings to the instructor of this course.

Student Resources for Remote Learning: Online learning may be new to you. Check out tips for success and find out more about online learning on the [Campus Life](#) page, and specifically on the [Student Resources for Remote Learning](#) page.

STUDENT RESPONSIBILITIES

Safe and Healthy Learning Environment: Section 30.3.4(6) c of the Code of Student Behaviour states: “No Student shall create a condition which endangers or potentially endangers or threatens the health, safety or well being of other persons.” Accordingly, students with

symptoms of *any* respiratory illness should avoid attending in-person activities for this class while they feel ill.

Academic Integrity: "The University of Alberta 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 Code of Student Behaviour (online at <https://www.ualberta.ca/governance/resources/policies-standards-and-codes-of-conduct/code-of-student-behaviour>) and avoid any behaviour which 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 forms of academic dishonesty are unacceptable at the University. Any suspected offence will be reported to the Faculty of Science. Anyone who is found in violation of the Code of Student Behaviour may receive a sanction. Typical sanctions include conduct probation, a mark reduction or a mark of 0 on an assessment, a grade reduction or a grade of F in a course, a remark on a transcript, and a recommendation for suspension or expulsion.

Cell Phones: Cell phones are to be turned off or on silent during lectures and labs. Please do not disturb other students or instructor with cell phones (e.g., leave the room if needed). Cell phones (and smart watches) are not to be brought to exams.

Students Eligible for Accessibility-Related Accommodations: Eligible students have both rights and responsibilities with regard to accessibility-related accommodations. Consequently, scheduling exam accommodations in accordance with AR deadlines and procedures is essential. Please note adherence to procedures and deadlines is required for U of A to provide accommodations. Contact AR (www.ualberta.ca/current-students/student-accessibility-services) for further information.

Academic Success Centre (1-80 SUB) (formerly the Student Success Centre): The Academic Success Centre (www.ualberta.ca/current-students/academic-success-centre) provides professional academic support to help students strengthen their academic skills and achieve their academic goals. Individual advising, appointments, and group workshops are available year round in the areas of Accessibility, Communication, Learning, and Writing Resources. Modest fees apply for some services.

Recording and/or Distribution of Course Materials: Audio or video recording, digital or otherwise, of lectures, labs, seminars or any other teaching environment by students is allowed only with the prior written consent of the instructor or as a part of an approved accommodation plan. Student or instructor content, digital or otherwise, created and/or used within the context of the course is to be used solely for personal study, and is not to be used or distributed for any other purpose without prior written consent from the content author(s).

Policy about course outlines can be found in the University Calendar (https://calendar.ualberta.ca/content.php?catoid=28&navoid=6961#Evaluation_Procedures_and_Grading_System).

Learning and Working Environment: The Faculty of Science is committed to ensuring that all students, faculty and staff are able to work and study in an environment that is safe and free from discrimination and harassment. It does not tolerate behaviour that undermines that environment.

If you are experiencing harassment, discrimination, fraud, theft or any other issue and would like to get confidential advice, please contact any of these campus services:

- [Office of Safe Disclosure & Human Rights](#): *A safe, neutral and confidential space to disclose concerns about how the University of Alberta policies, procedures or ethical standards are being applied. They provide strategic advice and referral on matters such as discrimination, harassment, duty to accommodate and wrong-doings. Disclosures can be made in person or online using the [Online Reporting Tool](#).*
- [University of Alberta Protective Services](#): *Peace officers dedicated to ensuring the safety and security of U of A campuses and community. Staff or students can contact UAPS to make a report if they feel unsafe, threatened, or targeted on campus or by another member of the university community.*
- [Office of the Student Ombuds](#): *A confidential and free service that strives to ensure that university processes related to students operate as fairly as possible. They offer information, advice, and support to students, faculty, and staff as they deal with academic, discipline, interpersonal, and financial issues related to student programs.*
- [Office of the Dean of Students](#): *They can assist students in navigating services to ensure they receive appropriate and timely resources. For students who are unsure of the support they may need, are concerned about how to access services on campus, or feel like they may need interim support while you wait to access a service, the Dean of Students office is here to help.*

Feeling Stressed, Anxious, or Upset?

It's normal for us to have different mental health experiences throughout the year, particularly as we adjust to returning to campus as we move through a pandemic. Know that there are people who want help. You can reach out to your friends and access a variety of supports available on and off campus at the [Need Help Now](#) webpage or by calling the 24-hour Distress Line: 780-482-4357 (HELP).

Policy about course outlines can be found in [Course Requirements, Evaluations Procedures and Grading](#) of the University Calendar.

Land Acknowledgement: The University of Alberta respectfully acknowledges that we are situated on Treaty 6 territory, traditional lands of First Nations and Métis people.

To learn more about the significance of this land acknowledgement, please read [this](#) useful article and associated links to more information.

Disclaimer: Any typographical errors in this Course Outline are subject to change and will be announced in class. The date of the final examination is set by the Registrar and takes precedence over the final examination date reported in this syllabus.

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