

# Paleo 201: Dinosaurs in the Fossil Record

## Section: Lec A1

### Syllabus Winter 2021

**INSTRUCTOR:** Gavin Bradley

**OFFICE HOURS:** Online only, by appointment or Fridays 10am-11 am.

**E-MAIL ADDRESS:** [gbradley@ualberta.ca](mailto:gbradley@ualberta.ca)

**COURSE FORMAT:** This course is blended-delivery. Students will engage with the Dino 101 MOOC videos and course notes on Coursera, AND the instructor-given lectures, guest lectures, and activities on eClass. Exams will use both [Exam Lock](#) and [Smart Exam Monitor](#)- you must read the “Remote Delivery Considerations” of this syllabus, and follow the links within it.

**MOOC PORTION OF COURSE:** To access, the videos/notes on Dino 101, first sign up for a free Coursera account at: <http://www.coursera.org> using your **ualberta.ca** email address. When you've done this, click the permalink below to join the University of Alberta's exclusive class. You will be joining the free (not Signature) version of Dino 101 with Coursera. If you accidentally enroll in the paid version, you will need to apply to Coursera, not me or the University, for a refund. It is the students' responsibility to work their way through the online material.

Here is the link: <https://coursera.org/groups/dino101-ltvab/invitation>

**ECLASS PORTION OF THE COURSE:** To access the eClass site, go to <https://eclass.srv.ualberta.ca/portal/> login to the University of Alberta Credit Courses section, and select PALEO 201. **On eClass you will engage with the lecture content from myself and the guest lecturers (worth participation marks), complete your graded quizzes, graded assignments and midterm/final. Lectures on eClass will be asynchronous, to keep things accessible as possible, but participation quizzes based on each lecture, will need to be completed by the Sunday following the lecture being posted.** Students registered in PALEO 201 should use the eClass forums, not the Coursera forums to ask questions of the instructor or classmates. It will not be possible for the instructor to monitor the Coursera forums. Eclass is also where I will post info about the class schedule, assessments, changes, grades and hold my open office hour via Zoom.

**FIRST DAY OF CLASSES:** January 11, 2020

**LAST DAY OF CLASSES:** April 16, 2020.

**STUDENT WELLNESS:** I understand that University is a stressful time for everyone, particularly so with the transition to online learning, so it is important to take care of your mental health and happiness. If you are feeling overwhelmed, anxious, or just need someone to talk to, please be aware that there are a number of different sources of help at the University; from the Peer Support Centre to free Counselling and Clinical Services. Alternatively, remember that your Instructors and TAs can be

resources too, and are here to listen and help.

For more information, please visit:

<https://www.ualberta.ca/current-students/wellness/mental-health>

### **COURSE DESCRIPTION: Dinosaurs in the Fossil Record**

\* 3 (fi 6) (either term, 3-0-0). For students who want a deeper understanding of the fossil record, this course will augment the topics of PALEO 200 (fossilization, fossil collection/curation, morphological analysis, organismal evolution, paleoecology, protection of fossils, speciation, stratigraphy, and taphonomy) activities and in-class lectures. Students will attend lectures on the biology of dinosaurs and other extinct animals, which will include topics such as the determination of age, behaviour, breeding, life cycles, physiology, and sexes of fossil animals. A portion of this course will be delivered on-line.

**Prerequisites:** Biology 30 or equivalent, or any 100- level course in the Faculty of Science. Note: Students who have obtained credit for PALEO 200 cannot take PALEO 201 for credit.

#### **A. Organization**

The main part of this course will be delivered online through the Dino 101 MOOC on Coursera, and students will work through each lesson at any time during the week that the lesson is recommended; these course notes and videos will form the content for the midterm and the final. The online portion of the course will be supplemented by asynchronous lectures delivered by the course instructor and/or guest lecturers on eClass, which will be posted on Tuesday and Thursday of each week by 9:30 AM. There will be participation marks for each lecture, taken from a brief quiz to be completed by 11:59pm on the Sunday after the lecture is posted. In addition, there will be short assignments based on the eClass lectures or “virtual trips/activities” (e.g. Geoscience Garden, microsite fossils, Smithsonian Virtual Museum trip etc), and short weekly quizzes posted on eClass, based on the Dino 101 content (**1-6 to be completed before midterm, 7-12 to be completed by final**).

#### **B. Course objectives**

In this course, students will learn about the many kinds of non-avian dinosaurs that roamed the earth during the Mesozoic Era, from 250 to 66 million years ago. By the end of this course students will be able to:

- Describe the diversity in dinosaur appearances, identify bony and soft tissue structures, and compare major features of the major groups of dinosaurs
- Describe how fossils form and interpret the taphonomy of skeletons and bonebeds
- Discuss the variety of feeding habits and feeding adaptations amongst the major dinosaurs groups

- Recognize general modes and styles of locomotion in major dinosaur groups
- Discuss the life history of a dinosaur and describe major techniques used to evaluate growth stages and growth rates in dinosaurs
- Compare defensive and offensive behaviors and structures in herbivorous and carnivorous dinosaurs
- Define a species and compare the strengths and weaknesses of different species concepts.
- Explain the basic theory of evolution and interpret a phylogenetic tree
- Recall the basic laws of stratigraphy and the geologic time scale; Discuss the evolution of dinosaurs through time, and identify which groups evolved when and where.
- Discuss basic concepts of plate tectonics and the evolution of the Earth's surface
- Describe the evolution of dinosaurs and differentiate them from non-dinosaurian archosaurs
- Describe the end-Cretaceous extinction event, and provide examples of vertebrate groups that both persisted and died out during the event

### C. Course topics

The online course will cover the following topics:

Lesson 1: "Appearances and Anatomy" covers the diversity in dinosaur appearances, and students will be able to identify major features of the major groups of dinosaurs.

Lesson 2: "Death and Fossilization" describes how fossils form, how we interpret the taphonomy of skeletons and bonebeds, and looks at the possible biases taphonomic events may create in the fossil record.

Lesson 3: "Eating" looks at the variety of food types, feeding habits, and feeding adaptations amongst the major groups of dinosaurs.

Lesson 4: "Moving Around" helps students understand the general modes and styles of locomotion in the major dinosaur groups. The lesson also describes general methods of evaluating hypotheses on locomotion.

Lesson 5: "Birth, Growth, Reproduction" provides a generalized life history of a dinosaur, from birth through adulthood, including reproduction. The student will be able to describe major techniques of evaluating growth stages and rates in dinosaurs.

Lesson 6: "Attack and Defense" examines the behaviours and structures that may have served for attack or defense through the lifetime of a dinosaur.

#### **Midterm Exam: Week of March 1- 5**

Lesson 7: "What is a Species" will teach the different ways of defining what a species is. Students will be able to compare the strengths and weaknesses of different species concepts.

Lesson 8: "Evolution" will describe the basic theories of speciation, and discusses how these different methods of speciation may have occurred, including both hypothetical and empirical examples.

Lesson 9: "Stratigraphy and Geologic Time" provides basic stratigraphic concepts and the scale of earth history. Students will learn about the evolution of groups of dinosaurs through time.

Lesson 10: "Palaeogeography and Plate Tectonics" presents the basic concepts in plate tectonics and the evolution of the earth's surface.

Lesson 11: "Dinosaur Origins" will look at the evolution of dinosaurs from non- dinosaurian archosaurs.

Lesson 12: "Dinosaur Extinction" will examine the end Cretaceous extinction event, and provide examples of vertebrate groups that both persisted and died out during the event.

**Final Exam: Week of April 19- 23**

**D. Text and required supplies**

In addition to the online lectures, a study guide will be posted for each lesson on eClass. These are **required readings** unless noted otherwise. A list of recommended publications will be provided for those interested in additional information on dinosaurs and palaeontology.

**E. Grading plan:**

End of lesson and in-lesson quizzes on Coursera are provided for the benefit of students, but are not graded. eClass quizzes will be graded.

Midterm	30%
Final Exam	35% (No possibility of reexamination in this course)
eClass weekly Quizzes	5%
Online Activities (*Geoscience, Trackways, Smithsonian, Microsite, Dino Lab, "Field work")	18%
Attendance/Class Participation (must be completed before 11:59PM on the Sunday of each lecture week)	10%
Discussion forum post activity (x2)	2%

These are the current planned activities, though topics may change. **Any and all requests for extra credit will be denied.**

**Class participation:** Grading for 'virtual attendance' will be based on short-answer questions based on the lecture, that must be completed by 11:59pm on the Sunday after the lecture is posted. The instructor will mark these questions, and 16 of the 24 lectures throughout the semester will be graded (there are 6 activities, and 2 participation activities that will take the place of the other 8 participation quizzes). These participation questions will be graded as follows:

- Correct answer: 1
- Incorrect answer: 0.5
- No answer submitted: 0

**Optional Learning Resources:** Quizlet study aids and audio versions of the course notes will be uploaded onto eClass throughout the year. For those interested in additional information on the dinosaurs or concepts introduced in this course, titles of additional reading material will also be provided on eClass.

**Midterm Exam:** The midterm exam will be multiple choice and cover lessons 1-6 of the Dino 101 content (videos/course notes) only; you won't be tested on eClass lectures from myself or guest lecturers.

**Final Exam:** The final exam will be multiple choice, is not cumulative, and will cover lessons 7-12 of the Dino 101 content (videos/course notes), with the caveat that the foundational knowledge of the course will obviously help your performance in the final. You won't be tested on eClass lectures from myself or guest lecturers.

**NOTE:** Students will have access to sample multiple-choice questions in the style they can expect to see on the midterm and final exams. These examples of representative evaluative material can be found on the eClass site.

### **GRADE EVALUATION**

Grade Evaluation will be by a combination of relative standing in the class and absolute achievement. This means that each assignment and test will be assigned a numerical mark and those marks will be summed. A final grade will be assigned based on the overall quality of the work done and where possible on natural breaks in the grade distribution, so as to be consistent in standard with previous years' grading. No absolute grade distribution ('curve') will be imposed on the grades, but the overall level and range of grades is likely to be similar to other classes at this level at the University of Alberta, in which the mean grade is typically in the B to B+ range.

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

### **F. ECLASS LECTURE SCHEDULE**

**NOTE: Lessons on this schedule may be cancelled or swapped at any time. This will not impact testable material, which will always be available online on Coursera. A class email or eClass forum post will be sent out on or before the date of a cancelled/swapped lecture, so remember to keep an eye on these.**

<b>Tuesday</b>	Jan 12	<b>Lecture</b>
Thursday	Jan 14	<b>Lecture</b>
<b>Tuesday</b>	Jan 19	<b>Lecture</b>

Thursday	Jan 21	<a href="#">Gavin: Trackways (Activity)</a>
<b>Tuesday</b>	Jan 26	<b>Lecture</b>
Thursday	Jan 28	<b>Lecture</b>
<b>Tuesday</b>	Feb 2	<b>Lecture</b>
Thursday	Feb 4	<a href="#">Gavin Geoscience Garden (Activity)</a>
<b>Tuesday</b>	Feb 9	<b>Lecture</b>
Thursday	Feb 11	<b>Lecture</b>
<b>Tuesday</b>	Feb 16	<b>Reading Week- no class</b>
Thursday	Feb 18	<b>Reading Week- no class</b>
<b>Tuesday</b>	Feb 23	<b>Lecture</b>
Thursday	Feb 25	<a href="#">Gavin: Paleo Museum (Activity)</a>
<b>Tuesday</b>	March 2	<b>Midterm week- no class</b>
Thursday	March 4	<b>Midterm week- no class</b>
<b>Tuesday</b>	March 9	<b>Lecture</b>
Thursday	March 11	<a href="#">Dino Lab (Activity)</a>
<b>Tuesday</b>	March 16	<b>Lecture</b>
Thursday	March 18	<b>Lecture</b>
<b>Tuesday</b>	March 23	<b>Lecture</b>
Thursday	March 25	<a href="#">Gavin: Microsites (Activity)</a>
<b>Tuesday</b>	March 30	<b>Lecture</b>
Thursday	April 1	<b>Lecture</b>
<b>Tuesday</b>	April 6	<b>Lecture</b>
Thursday	April 8	<a href="#">Gavin: Smithsonian (Activity)</a>
<b>Tuesday</b>	April 13	<b>Lecture</b>
Thursday	April 15	<b>Lecture</b>
Tuesday	April 20	<b>Final exam week- no class</b>
Thursday	April 22	<b>Final exam week- no class</b>

---

## 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 webcam and 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](mailto:dosdean@ualberta.ca)) directly to explore options and support.

Please contact the instructor by the add/drop deadline [January 22nd, 2021] if you do not have access to the minimum technology recommended. The instructor will make arrangements 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.

**Remote Proctoring Consideration:**

We will use a remote proctoring service for exams. Your computer and environment will be monitored during exams.

- You should arrange for a place to write timed exams without interruption.
- Tablets and mobile devices are incompatible with remote proctoring services.
- These services require a working webcam.

**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.

**Missed Assessments Where the Cause is Religious Belief:**

For an excused absence where the cause is religious belief, a student must contact the instructor(s) within two weeks of the start of Fall or Winter classes to request accommodation for the term (including the final exam, where relevant). Instructors may request adequate documentation to substantiate the student request. Students who failed at the start of term to request exam accommodations for religious beliefs are expected to follow the deferred final examination process outlined below.

**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. 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 (<https://calendar.ualberta.ca/content.php?catoid=29&navoid=7238#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.

**Re-examination:**

A student who writes the final examination and fails the course may apply for a re-examination. Re-examinations are rarely granted in the Faculty of Science. Re-examinations are governed by university-wide Academic Regulations and Faculty of Science Academic Regulations. Misrepresentation of Facts to gain a re-examination is a serious breach of the Code of Student Behaviour.

**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 [www.governance.ualberta.ca](http://www.governance.ualberta.ca)) 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 the transcript, and a recommendation for suspension or expulsion.

Students are expected to familiarize themselves with the [Academic Integrity](#) resources (covering the topics of cheating, collaboration, plagiarism, and substantial assistance) on the website of the Office of the Dean of Students.

*Please don't try to use the online format as an excuse or opportunity to cheat- there are so many ways to catch you (probably more than in in-person exams). Whatever the assessment, just take the hit- it will be worth very little in your overall degree, in contrast to an F8 (Failing grade, with "Cheating" attached) on your transcript.*

**EXAM CONDUCT:** Your student photo I.D. is required at exams to verify your identity. All cell phones must be turned off and stored in your bags, and smart watches should not be worn. Hats must not be worn (please note that this does not include religious head coverings).

**Additional Learning Resources and Assistance:****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 [Accessibility](#)



[Resources](#) deadlines and procedures is essential. Please note adherence to procedures and deadlines is required for U of A to provide accommodations. Contact [Accessibility Resources](#) for further information.

**Academic Success Centre:** Students who require additional help in developing strategies for better time management, study skills or examination skills should contact the Academic Success Centre <https://www.ualberta.ca/current-students/academic-success-centre>, located in SUB (Student Union Building). They also provide writing resources.

**Centre for Writers:** Students desiring additional assistance with writing assignments (both native and non-native English speakers) can visit the Centre for Writers <https://www.ualberta.ca/current-students/centre-for-writers> located in Assiniboia Hall. One-on-one appointments can be booked online at their website, along with workshops and additional assistance.

**Counselling and Clinical Services, and the University Health Centre:** Learning effectively is difficult if you feel unwell, both physically and mentally. For any and all mental health concerns please contact Counselling and Clinic Services (<https://www.ualberta.ca/current-students/counselling>), located in SUB (Student Union Building). For physical health concerns, please contact the University Health Centre (<https://www.ualberta.ca/services/health-centre>), also located in SUB. Both are great resources, and you shouldn't hesitate to contact either if you have any health concerns.

**Recording and/or distribution of course material:** Audio or video recording, digital or otherwise, of course content by students is not allowed. 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.

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

**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.**

**COPYRIGHT:** Gavin Bradley, Department of Earth and Atmospheric Sciences; Science Education Learning and Innovation Facilitation Team, Faculty of Science, University of Alberta (2021). With thanks to Dr. Phil Currie, Dr. Victoria Arbour, Dr. Scott Persons, Dr. Michelle Merkarski, Dr. Angelica Torices, and Dr. Hallie Street for previous years' syllabi.