

**DEPARTMENT of SCIENCE**  
**COURSE OUTLINE – Fall 2019**

**PALE200 (A2): Introduction to Paleontology – 3 (3-0-0) 45 Hours over 15 Weeks**

<b>INSTRUCTOR:</b>	Matthew Vavrek	<b>PHONE:</b>	N/A
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<b>OFFICE HOURS:</b>	By appointment		

**CALENDAR DESCRIPTION:** Students will learn the fundamental processes of how and what we know about the fossil record, with a special focus on dinosaurs. Topics include fossilization, fossil collection/curation, morphological analysis, organismal evolution, paleoecology, protection of fossils, speciation, stratigraphy, and taphonomy. Students learn how paleontological research determines the ages, behaviour, breeding, life cycles, physiology, sexes and other aspects of the biology of dinosaurs and other extinct animals.

**PREREQUISITE(S)/COREQUISITE:** Biology 30 or equivalent or 1000-level science course or consent of instructor.

**REQUIRED TEXT/RESOURCE MATERIALS:** *A Guide to Common Vertebrate Fossils from the Cretaceous of Alberta* by Hope Johnson.

**DELIVERY MODE(S):** The class will be primarily lecture based, with an additional field based class, currently scheduled for October 5th. The course will operate on a "flipped" classroom model, with students using the University of Alberta Dino 101 course modules available on Coursera (<https://www.coursera.org/learn/dino101>)

Lectures – Monday 18:00-20:50, Rm. J107

**COURSE OBJECTIVES:**

1. Understand the general progression and timing of life on earth from its first appearance to today, with a special focus on non-avian dinosaurs
2. Demonstrate knowledge of the major groups of non-avian dinosaurs, including their primary characteristics, physiology and their relationships to each other and other major branches of vertebrates
3. Demonstrate knowledge of large scale geological and ecological processes that have influenced dinosaur evolution
4. Demonstrate knowledge of the collection, curation and ownership of fossils, particularly in Alberta

**LEARNING OUTCOMES:** Upon completion of this course the student will have a working knowledge of the history and development of the field of palaeontology. As well, students will have a general understanding of the major geological processes that have influenced the evolution and ecology of dinosaurs, and the general timing and appearance of major dinosaur groups through the Mesozoic.

**TRANSFERABILITY:**

**University of Calgary; University of Alberta; King's University College; University of Lethbridge  
Grant MacEwan University**

**\*Warning:** Although we strive to make the transferability information in this document up-to-date and accurate, **the student has the final responsibility for ensuring the transferability of this course to Alberta Colleges and Universities.** Please consult the Alberta Transfer Guide for more information. You may check to ensure the transferability of this course at Alberta Transfer Guide main page <http://www.transferalberta.ca> or, if you do not want to navigate through few links, at <http://alis.alberta.ca/ps/tsp/ta/tbi/onlineSearch.html?SearchMode=S&step=2>

**\*\* Grade of D or D+ may not be acceptable for transfer to other post-secondary institutions. Students are cautioned that it is their responsibility to contact the receiving institutions to ensure transferability**

**EVALUATIONS: Assignments - 50%**  
**Midterm Exam - 20%**  
**Final Exam - 30%**

**GRADING CRITERIA: (The following criteria may be changed to suit the particular course/instructor)**  
 Please note that most universities will not accept your course for transfer credit **IF** your grade is **less than C-**.

Alpha Grade	4-point Equivalent	Percentage Guidelines		Alpha Grade	4-point Equivalent	Percentage Guidelines
A+	4.0	90-100		C+	2.3	67-69
A	4.0	85-89		C	2.0	63-66
A-	3.7	80-84		C-	1.7	60-62
B+	3.3	77-79		D+	1.3	55-59
B	3.0	73-76		D	1.0	50-54
B-	2.7	70-72		F	0.0	00-49

**COURSE SCHEDULE:** Students will be expected to review online material/resources BEFORE the in class lecture, as the lectures are designed for more in depth discussion and debate of the concepts. There will be a field trip on October 5<sup>th</sup> to both a local fossil hotspot (weather permitting) and to the Philip J. Currie Dinosaur Museum.

Date	Topic
September 9 <sup>th</sup>	"Appearances and Anatomy" - Students will learn the major groups of dinosaurs and their main defining characteristics.
September 16 <sup>th</sup>	"Death and Fossilization" - Students will learn about the processes acting on an organism after it dies that will lead to it becoming (or not becoming) a fossil (i.e. taphonomy and diagenesis).
September 23 <sup>th</sup>	"Eating" - What types of food did dinosaurs eat, and what were the habits and feeding adaptations that each group possessed.
September 30 <sup>th</sup>	"Moving Around" - What are the different locomotory methods that different groups of dinosaurs used, and what were the adaptive advantages or disadvantages of each type? Also, how can modern researchers infer locomotory function in extinct animals?
October 5 <sup>th</sup>	Field Trip (location to be determined closer to date)
October 7 <sup>th</sup>	"Birth, Growth, Reproduction" - What is the general 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.
October 11 <sup>th</sup>	Assignment #1 Due
October 21 <sup>st</sup>	"Attack and Defence" - What types of adaptations did dinosaurs possess that would have allowed for attack or defense? What types of behaviours can be inferred from fossil evidence?
October 28 <sup>th</sup>	MIDTERM EXAM
November 4 <sup>th</sup>	"What is a Species" - What are the major species concepts that are used in palaeontology? What are the differences between the major concepts, and what concept would be used in a given situation? "Evolution" - What are the basic processes underlying evolution, and by what means might a new species arise?
November 18 <sup>th</sup>	"Stratigraphy and Geologic Time" - Students will learn the basic geological principles surrounding stratigraphy and how geologic time is determined, as well as how these concepts relate to our understanding of the evolution of dinosaurs and other life on earth.
November 25 <sup>th</sup>	"Palaeogeography and Plate Tectonics" - What are the basic principles of plate tectonics, and how may have changes in the earth's surface led to effects on dinosaur history?
December 2 <sup>nd</sup>	"Dinosaur Origins" - What are the phylogenetic, temporal and geographic origins of dinosaurs?
December 6 <sup>th</sup>	Assignment #2 Due
December 9 <sup>th</sup>	"Dinosaur Extinction" - How have both minor and major extinction events affected the evolution and ecology of dinosaurs through time.
TBD	FINAL EXAM

**STUDENT RESPONSIBILITIES:** Students must come to class prepared to discuss the topics covered that week, by completing the online resources for that week. Students are also responsible for all assignments to be completed outside of class time.

**STATEMENT ON PLAGIARISM AND CHEATING:** Cheating and plagiarism will not be tolerated and there will be penalties. For a more precise definition of plagiarism and its consequences, refer to the Student Conduct section of the College Admission Guide at [http://www.gprc.ab.ca/programs/calendar/\\_or](http://www.gprc.ab.ca/programs/calendar/_or) the College Policy on Student Misconduct: Plagiarism and Cheating at <http://www.gprc.ab.ca/about/administration/policies/>

**\*\*Note:** all Academic and Administrative policies are available on the same page.

**CLASS PARTICIPATION AND TECHNOLOGY USE:** If you need a laptop, tablet, or any other device for taking notes or otherwise participating in class, that's fine. However, please do not use a personal device for any purpose unrelated to our class. All devices should be silenced. Cell phones should be put away, unless we are using them for a class activity. If you aren't participating, you aren't learning. I would much rather you spend your time in class working on the tasks and assignments you are given rather than wasting your own time at home trying to finish them. If there is a serious need to leave your cell phone on, such as a family emergency, please put it on vibrate and let me know. If you leave the classroom to take a call, I'll understand why.