Term Information

Effective Term	Spring 2023
Previous Value	*Spring 2014*

Course Change Information

What change is being proposed? (If more than one, what changes are being proposed?)

Increase credit hours from 2 to 3

What is the rationale for the proposed change(s)?

We would like to increase the lecture time from 55 minutes 2 times per week to 1 hour and 20 minutes (80 minutes) 2 times per week. This will allow us to add in class assignments which we feel will greatly augment the material, in addition to allowing us to meet the learning objectives required for the proposed new GE theme of 'Origins and Evolution'. The in-class assignments will range from case studies to measuring dinosaur trackways. We estimate these will take between 20 and 30 minutes (depending on the material) per week. The instructors have found that covering all course material in the current format 2 contact hours is challenging, and 2 hours would not be sufficient to allow for the addition of proposed in-class assignments and class discussions.

What are the programmatic implications of the proposed change(s)?

(e.g. program requirements to be added or removed, changes to be made in available resources, effect on other programs that use the course)?

None

Is approval of the requrest contingent upon the approval of other course or curricular program request? No

Is this a request to withdraw the course? No

General Information

Course Bulletin Listing/Subject Area	Evol, Ecology & Organismal Bio
Fiscal Unit/Academic Org	Evolution, Ecology & Org Bio - D0390
College/Academic Group	Arts and Sciences
Level/Career	Undergraduate
Course Number/Catalog	2250
Course Title	Dynamics of Dinosaurs
Transcript Abbreviation	Dyn Dinosaurs
Course Description	A review of current information on dinosaur biology, emphasizing scientific approaches to reconstructing dinosaurs as living, dynamic animals.
Semester Credit Hours/Units	Fixed: 3
Previous Value	*Fixed: 2*

Offering Information

Length Of Course	14 Week, 12 Week, 8 Week, 7 Week, 6 Week
Flexibly Scheduled Course	Never
Does any section of this course have a distance education component?	No
Grading Basis	Letter Grade
Repeatable	No
Course Components	Lecture
Grade Roster Component	Lecture
Credit Available by Exam	No

Admission Condition Course	No
Off Campus	Never
Campus of Offering	Columbus, Lima, Mansfield, Marion, Newark

Prerequisites and Exclusions

Prerequisites/Corequisites	Prereq: 4 sem cr hrs in Biological Sciences or Historical Geology.
Exclusions	
Electronically Enforced	Yes
Previous Value	**No**

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code	26.1303
Subsidy Level	Baccalaureate Course
Intended Rank	Freshman, Sophomore, Junior, Senior
Previous Value	*Freshman, Sophomore*

Requirement/Elective Designation

The course is an elective (for this or other units) or is a service course for other units

Course Details

Course goals or learning objectives/outcomes

- Learn the basic principles and concepts guiding paleobiological study of life on earth.
- Understand how paleobiology works as a science that tests hypotheses about extinct organisms and past environments.
- Know the evolutionary origin and radiation of the dinosaur lineages, and develop an informed historical perspective of how dinosaurs have impacted life on earth.
- Understand how aspects of the life of dinosaurs (and other extinct organisms) can be reconstructed using scientific methods
- Be able to distinguish between science-based and non-science based opinions expressed in popular press accounts of dinosaur biology

Previous Value

- *Extinction*

Content Topic List

- Geological history of earth
- Evolution of life up to and during the Mesozoic era
- Fossilization, methods of fossil collection and interpretation
- Scientific method
- Dinosaur evolution and systematics
- Scaling in nature and effect of body size
- Sexual selection
- Ecology of dinosaurs

Sought Concurrence

No

Attachments

- EEOB Curriculum Maps April 2022.xlsx: Curriculum Maps

  (Other Supporting Documentation. Owner: Hamilton,Ian M)

- EEOB2250 syllabus NEW.docx: Syllabus - new version

  (Syllabus. Owner: Hamilton,Ian M)

- EEOB 2250 syllabus Old.doc: Syllabus - previous version

  (Syllabus. Owner: Hamilton,Ian M)

Comments

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Hamilton,Ian M	04/12/2022 02:35 PM	Submitted for Approval
Approved	Hamilton,Ian M	04/12/2022 02:35 PM	Unit Approval
Approved	Vankeerbergen,Bernadette Chantal	04/18/2022 12:40 PM	College Approval
Pending Approval	Cody,Emily Kathryn Jenkins,Mary Ellen Bigler Hanlin,Deborah Kay Hilty,Michael Vankeerbergen,Bernadette Chantal Steele,Rachel Lea	04/18/2022 12:40 PM	ASCCAO Approval

Dynamics of Dinosaurs Syllabus

EEOB2250 Autumn 2023

Course Information

- **Course times:** Tuesdays and Thursdays from 3:00 p.m. - 4:20 p.m.
- **Credit hours:** 3
- **Mode of delivery:** In person

Instructor

- **Name:** Erin Lindstedt
- **Email:** lindstedt.2@osu.edu
- **Office location:** Aronoff 106
- **Office hours:** Tuesdays and Thursdays from 2:00 p.m.-255 p.m.
- **Preferred means of communication:**
    - My preferred method of communication for questions is **email.**
    - My class-wide communications will be sent through the Announcements tool in CarmenCanvas. Please check your notification preferences (go.osu.edu/canvas-notifications) to be sure you receive these messages.

Teaching Assistant

- **Name:** [first and last name of TA]
- **Email:** [lastname.#@osu.edu]

Course Prerequisites

There are no course pre-requisites

Course Description

In recent decades there has been a dramatic increase in what we know about dinosaurs. Much of this new information has come from fossil discoveries, but many novel ideas have come from reinterpretation of available material and creative approaches to testing longstanding

assumptions. The dinosaurs portrayed by biologists today are radically different from the old stereotypes of dinosaurs as lumbering, dim-witted giants doomed to extinction. Instead, they are viewed as active, likely warm-blooded animals with complex social behaviors. How did this transformation take place? This course will examine the new ideas about dinosaurs and document how a variety of scientific studies have changed our perspective of them. Along the way, many different principles of biological science applicable to the study of dinosaurs will be discussed. A major theme of the class will be to examine how scientists working in a variety of disciplines can study and understand the nature and evolution of organisms long extinct.

This class is designed to be appropriate for undergraduates who are not majoring in biological sciences, though it should prove informative and challenging for biology majors.

Course Goals

1. **Learn the basic principles and concepts guiding paleobiological study of life on earth.**
2. **Understand how paleobiology works as a science that tests hypotheses about extinct organisms and past environments.**
3. **Know the evolutionary origin and radiation of the dinosaur lineages, and develop an informed historical perspective of how dinosaurs have impacted life on earth.**
4. **Understand how aspects of the life of dinosaurs (and other extinct organisms) can be reconstructed using scientific methods**
5. **Be able to distinguish between science-based and non-science based opinions expressed in popular press accounts of dinosaur biology**

Learning Outcomes

By the end of this course, students should successfully be able to:

Describe the basic geological history of the Earth and the evolution of life through the Mesozoic Era.

Explain the process of fossilization, the methods of fossil collection and preparation, and approaches to fossil interpretation.

Explain how paleobiological methods can reconstruct past environmental conditions (e.g., climate, etc.)

Describe the general history of dinosaur research, the major individuals involved and their contributions, and the role of personality in advancing (or hindering) our knowledge of dinosaurs.

Describe the evolutionary origin and radiation of the dinosaur lineages and explain the systematic methods used to determine their evolutionary relationships

Identify the major dinosaur taxa and describe their general way of life.

Explain scaling in nature and describe how size impacts the biology of organisms (such as dinosaurs).

Demonstrate how scaling and biomechanical techniques can be used to estimate body weights and locomotory abilities of dinosaurs

Explain the scientific evidence used to argue for or against endothermy in dinosaurs

Explain the fossil evidence underlying reconstructions of the reproductive and social behaviors of dinosaurs

Explain how sexual selection may be responsible for the evolution of many spectacular features of dinosaurs

Describe the evolution and biology of pterosaurs (the first flying vertebrates), and explain the biomechanical principles underlying the evolution of flight

Describe the evolution and biology of Mesozoic marine reptiles, and explain the evolutionary transformations involved in returning to life in the sea

Explain why birds actually are dinosaurs and how modern birds evolved

Discuss the scientific explanations for the great extinction event at the end of the Mesozoic Era

How This Course Works

Mode of delivery: Lectures are 100% in person. Recorded lectures will be available to students after course meeting times. There is an option for synchronous online sessions pending approval from the instructor.

Midterm exams are online and will be delivered on Carmen.

Credit hours and work expectations: This is a [3] credit-hour course. According to Ohio State bylaws on instruction (go.osu.edu/credithours), students should expect around [3] hours per week of time spent on direct instruction (instructor content and Carmen activities, for example) in addition to [6] hours of homework (reading and assignment preparation, for example) to receive a grade of [C] average.

Participation and assignment requirements: The following is a summary of students' expected participation:

- **Participating in in-class activities**: **at least once per week**
  You are expected to attend lectures every day. You will be required to participate in activities that are assigned during class and submit these by the end of the week.
- **Office hours and discussion boards**: **optional**
  All live, scheduled events for the course, including my office hours, are optional. Additionally, posting in the discussion board is optional
- **Popular Media Assignment: Required**

Course Materials, Fees and Technologies

Required Materials and/or Technologies

- You are required to have access to internet for CarmenCanvas access for announcements and lecture material, and exams will be given online through CarmenCanvas

Recommended/Optional Materials and/or Technologies

- The textbook is strongly recommended but not required **Dinosaurs: A Concise Natural History** by Fastovsky and Weishampel (3rd edition, 2016)

Required Equipment

- **Computer:** current Mac (MacOS) or PC (Windows 10) with high-speed internet connection
- **Other:** a mobile device (smartphone or tablet) to use for BuckeyePass authentication

Required Software

Microsoft Office 365: All Ohio State students are now eligible for free Microsoft Office 365. Visit the installing Office 365 (go.osu.edu/office365help) help article for full instructions.

CarmenCanvas Access

You will need to use BuckeyePass (buckeyepass.osu.edu) multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you do each of the following:

- Register multiple devices in case something happens to your primary device. Visit the BuckeyePass - Adding a Device (go.osu.edu/add-device) help article for step-by-step instructions.
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click **Enter a Passcode** and then click the **Text me new codes** button that appears. This will text you ten passcodes good for 365 days that can each be used once.
- Install the Duo Mobile application (go.osu.edu/install-duo) on all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.

If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357 (HELP) and IT support staff will work out a solution with you.

Technology Skills Needed for This Course

- Basic computer and web-browsing skills
- Navigating CarmenCanvas (go.osu.edu/canvasstudent)
- CarmenZoom virtual meetings (go.osu.edu/zoom-meetings)

Technology Support

For help with your password, university email, CarmenCanvas, or any other technology issues, questions or requests, contact the IT Service Desk, which offers 24-hour support, seven days a week.

- **Self Service and Chat**: go.osu.edu/it
- **Phone:** 614-688-4357 (HELP)
- **Email:** servicedesk@osu.edu

Digital Flagship

Digital Flagship is a student success initiative aimed at helping you build digital skills for both college and career. This includes offering an engaging collection of digital tools and supportive learning experiences, university-wide opportunities to learn to code, and a Design Lab to explore digital design and app development. Digital Flagship resources available to help Ohio State students include on-demand tutorials, The Digital Flagship Handbook (your guide for all things tech-related), workshops and events, one-on-one tech consultations with a peer or Digital Flagship staff member, and more. To learn more about how Digital Flagship can help you use technology in your courses and grow your digital skills, visit go.osu.edu/dfresources.

Grading and Faculty Response

How Your Grade is Calculated

Assignment Category	Points
In-class assignments (10 x 10 points)	100
Midterm exams (3 x 90) **- online**	270
Popular media assignment (30 points)	30
Total	400

See Course Schedule for due dates.

Writing assignment

Popular media writing assignment

Description:
An essay critiquing some popular media account of dinosaurs is on **Tuesday Nov. 23**. **YOU ARE ENCOURAGED TO TURN THE ESSAY IN EARLY IF YOU CAN.** The account can be an article, a movie, a TV show, etc. I want you to apply your knowledge of dinosaur biology to critically evaluate how realistically the dinosaur(s) are represented. What was accurate, highly speculative, unlikely, or blatantly wrong? Did the representation include outdated misperceptions about dinosaurs? Did the account include up-to-date information on dinosaur biology? **Focus your critique on information we have discussed in class that specifically concerns dinosaur biology (rather than just critique superficial, basic biological aspects that anyone might criticize).** If you use information from sources other than the course or textbook, provide references (in whatever format you prefer). The essay will be graded on content and also on organization and clarity of writing. Be sure to specify what article, film, etc. you are evaluating. Good essays need not to be more than about 3 (double-spaced) pages long. The assignment is worth 30 points.

Academic integrity and collaboration: Your written assignments should be your own original work with the exception of in-class assignments which are collaborative with other students. In formal assignments, you should follow [MLA/APA/Chicago etc.] style to cite the ideas and words of your research sources. You are encouraged to ask a trusted person to proofread your assignments before you turn them in but no one else should revise or rewrite

your work. For in class assignments, all collaborators/group members must be listed by name on the assignment

Late Assignments

Late submissions will not be accepted unless discussed with instructor.An assignment is considered late If it is 30 minutes past the due date/time. Please refer to Carmen for due dates

Instructor Feedback and Response Time

I am providing the following list to give you an idea of my intended availability throughout the course. Remember that you can call 614-688-4357 (HELP) at any time if you have a technical problem.

- **Preferred contact method:** If you have a question, please contact me first through my Ohio State email address. I will reply to emails within **24 hours on days when class is in session at the university**.
- **Class announcements:** I will send all important class-wide messages through the Announcements tool in CarmenCanvas. Please check your notification preferences (go.osu.edu/canvas-notifications) to ensure you receive these messages.
- **Discussion board:** This is a place for you to post interesting/cool articles videos etc related to the content of the class. This will not be graded but I may show items posted here in class
- **Grading and feedback:** For large weekly assignments, you can generally expect feedback within **seven days**

Grading Scale

93–100: A
90–92.9: A-
87–89.9: B+
83–86.9: B
80–82.9: B-
77–79.9: C+
73–76.9: C
70–72.9: C-
67–69.9: D+
60–66.9: D
Below 60: E

Other Course Policies

Discussion and Communication Guidelines

The following are my expectations for how we should communicate as a class. Above all, please remember to be respectful and thoughtful.

- **Writing style**: While there is no need to participate in class discussions as if you were writing a research paper, you should remember to write using good grammar, spelling, and punctuation. A more conversational tone is fine for non-academic topics.
- **Tone and civility**: Let's maintain a supportive learning community where everyone feels safe and where people can disagree amicably.
- **Citing your sources**: When we have academic discussions, please cite your sources to back up what you say. For the textbook or other course materials, list at least the title and page numbers. For online sources, include a link.
- **Backing up your work**: Consider composing your academic posts in a word processor, where you can save your work, and then copying into the Carmen discussion.

Academic Integrity Policy

See Descriptions of Major Course Assignments for specific guidelines about collaboration and academic integrity in the context of this online class.

Ohio State's Academic Integrity Policy

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the university's Code of Student Conduct (studentconduct.osu.edu), and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the university's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the university or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the university's *Code of Student Conduct* is never considered an excuse for academic misconduct, so I recommend that you review the *Code of Student Conduct* and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by university rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the university's Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the university.
If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- Committee on Academic Misconduct (go.osu.edu/coam)
- Ten Suggestions for Preserving Academic Integrity (go.osu.edu/ten-suggestions)
- Eight Cardinal Rules of Academic Integrity (go.osu.edu/cardinal-rules)

Copyright for Instructional Materials

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

Statement on Title IX

All students and employees at Ohio State have the right to work and learn in an environment free from harassment and discrimination based on sex or gender, and the university can arrange interim measures, provide support resources, and explain investigation options, including referral to confidential resources.

If you or someone you know has been harassed or discriminated against based on your sex or gender, including sexual harassment, sexual assault, relationship violence, stalking, or sexual exploitation, you may find information about your rights and options on Ohio State's Title IX website (titleix.osu.edu) or by contacting the Ohio State Title IX Coordinator at titleix@osu.edu. Title IX is part of the Office of Institutional Equity (OIE) at Ohio State, which responds to all bias-motivated incidents of harassment and discrimination, such as race, religion, national origin and disability. For more information, visit the OIE website (equity.osu.edu) or email equity@osu.edu.

Commitment to a Diverse and Inclusive Learning Environment

The Ohio State University affirms the importance and value of diversity in the student body. Our programs and curricula reflect our multicultural society and global economy and seek to provide opportunities for students to learn more about persons who are different from them.

We are committed to maintaining a community that recognizes and values the inherent worth and dignity of every person; fosters sensitivity, understanding, and mutual respect among each member of our community; and encourages each individual to strive to reach his or her own potential. Discrimination against any individual based upon protected status, which is defined as age, color, disability, gender identity or expression, national origin, race, religion, sex, sexual orientation, or veteran status, is prohibited.

Your Mental Health

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce a student's ability to participate in daily activities. No matter where you are engaged in distance learning, The Ohio State University's Student Life Counseling and Consultation Service (CCS) is here to support you. If you find yourself feeling isolated, anxious or overwhelmed, on-demand mental health resources (go.osu.edu/ccsondemand) are available. You can reach an on-call counselor when CCS is closed at 614- 292-5766**. 24-hour emergency help** is available through the National Suicide Prevention Lifeline website (suicidepreventionlifeline.org) or by calling 1-800-273-8255(TALK). The Ohio State Wellness app (go.osu.edu/wellnessapp) is also a great resource.

Accessibility Accommodations for Students with Disabilities

Requesting Accommodations

The university strives to make all learning experiences as accessible as possible. If you anticipate or experience academic barriers based on your disability including mental health, chronic or temporary medical conditions, please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services (SLDS). After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion.

Disability Services Contact Information

- Phone: 614-292-3307
- Website: slds.osu.edu
- Email: slds@osu.edu
- In person: Baker Hall 098, 113 W. 12th Avenue

Accessibility of Course Technology

This online course requires use of CarmenCanvas (Ohio State's learning management system) and other online communication and multimedia tools. If you need additional services to use these technologies, please request accommodations with your instructor.

- CarmenCanvas accessibility (go.osu.edu/canvas-accessibility)
- Streaming audio and video
- CarmenZoom accessibility (go.osu.edu/zoom-accessibility)
- Collaborative course tools

Course Schedule

Refer to the CarmenCanvas course for up-to-date due dates.

Week	Points	Topics, Readings, Assignments, Due Dates
1	5	**T Topic: Introduction and aims – Why study dinosaurs? The history of the study of dinosaurs (Chapters 2,15)** **H Topic: Review of the geological history of the earth and the evolution of life up to the Mesozoic - setting the stage for the dinosaurs (Chs.2,14)** In-class assignment: Constructing a geologic Time Scale
2	5	**T Topic: Fossil formation, excavation, and interpretation (contd) (Chs.1,2)** **H Topic: Taphonomy – the study of the circumstances of fossil deposition and their relationship to the biology of fossil organisms; methods of reconstructing paleoclimates and environments** In-class assignment: Interpreting taphonomy of a fossil (case study)
3	5	**T Topic: Taphonomy – the study of the circumstances of fossil deposition and their relationship to the biology of fossil organisms; methods of reconstructing paleoclimates and environments** **H Topic: The evolutionary origin and radiation of the dinosaurs; dinosaurs as "revolutionary" organisms (Chs. 4, 5, and 14).** In-class assignment: Constructing a phylogenetic tree
4	5	**T Topic: The evolutionary origin and radiation of the dinosaurs; dinosaurs as "revolutionary" organisms cont (Chs. 4, 5, and 14)** **H Topic: The classification and phylogenetic relationships of dinosaurs; review of the Saurischian lineages (Chs. 5, 6, 7, and 9)**

		In-class assignment: Discussion: Old vs New View of Dinosaur phylogeny (What to believe?)
5	90	**T Topic: Review of the Ornithischian lineages (chapters 5, 10, 11, and 12)** **H: **MIDTERM I: Covers material from weeks 1-5, open from 7:00 a.m.-11:59 p.m.**** In-class assignment: NONE
6	5	**T Topic: Explaining the spectacular success of dinosaurs (good genes or good luck?); selecting living models for dinosaurs; The problem of size and scaling in nature (or how do you design really big animals?); understanding the evolution of large size is dinosaurs (no readings)** **H Topic: How big were the largest dinosaurs? – methods of estimating body weights; how fast could dinosaurs move? - biomechanical methods of estimating athletic abilities** In-class assignment: Estimating mass of dinosaurs: a comparison of methods
7	5	**T Topic: The formation and interpretation of fossil trackways; reconstructing dinosaur movements and calculating speeds from fossil trackways** **H Topic: Warm-blooded dinosaurs? Reconstructing the metabolic strategies of dinosaurs (Ch. 13)** In-class assignment: Estimating dinosaur speed (case study)
8	0	**T Topic: Warm-blooded dinosaurs? (contd) (Ch. 13)** **H: *Autumn break (no class)***

		In-class assignment: NONE
9	5	**T Topic: Studying the social behavior of extinct animals - evidence of herding and parental behavior in dinosaurs** **H Topic: Sexual selection and dinosaurs (parts of chapters 11 and 12)** In-class assignment: Estimating Age a growth Rates from LAG data and discussion of parental care in dinosaurs
10	5	**T Topic: Sexual selection and dinosaurs (contd) (parts of chapters 11 and 12)** **H Topic: Biology of the largest terrestrial animals to ever exist - the sauropods** **(Ch.9)** In-class assignment: Interpreting cranial ornamentation: sexual selection, species recognition or growth?
11	90	**T: **MIDTERM II (on CarmenCanvas): Covers material from weeks 6-10, open from 7:00 a.m.-11:59 p.m.**** **H Topic: The biology of the largest terrestrial predators –the tyrannosaurids and other large theropods – active hunters or scavengers? (parts of chapters 6 and 7)** In-class assignment: NONE
12	5	**T Topic: The remarkable dromaeosaurids (aka "raptors") – the dinosaurs that launched the revolution in dinosaur biology (parts of chapters 6 and 7)** **H: *Veterans Day (no class)***

		In-class assignment: What happened to all the big predators?
13	5	**The Mesozoic battle tanks – biology of the Thyreophorans (Ch. 10)** **The evolution and biology of the first and the largest flying vertebrates - the pterosaurs** In-class assignment: How many species are present?
14	30	**The Mesozoic sea monsters - the ichthyosaurs, sauropterygians, and mosasaurs** **25 THANKSGIVING HOLIDAY (traditional meal of dinosaur)** In-class assignment: NONE ***Popular Media Assignment: DUE***
15	5	**Dinosaurs and the origin of birds (Ch 7)** **The great Cretaceous extinction - hypotheses and evidence (Ch.16)** In-class assignment: The K-T Extinction-how rapid was it?
16	90	**T: *MIDTERM III (on CarmenCanvas): Covers material from weeks 11-15, open from 7:00 a.m.-11:59 p.m.****

EEOB 2250 – DYNAMICS OF THE DINOSAURS Autumn, 2021

COURSE SYLLABUS

TuTh 3:55-4:50 pm –0160 Pomerene Hall

Instructor - Dr. Erin Lindstedt
116 Aronoff Lab
318 W. 12th Avenue
lindstedt.2@osu.edu

Office hours - My office hours will be held in my zoom room (761 029 1582) on Tuesdays from 2:30-3:55(right before class)
https://osu.zoom.us/j/7610291582?pwd=Nzl1NEEvMnhsNkViYnEyeTFwUU5mdz09

Course Rationale:

In recent decades there has been a dramatic increase in what we know about dinosaurs. Much of this new information has come from fossil discoveries, but many novel ideas have come from reinterpretation of available material and creative approaches to testing longstanding assumptions. The dinosaurs portrayed by biologists today are radically different from the old stereotypes of dinosaurs as lumbering, dim-witted giants doomed to extinction. Instead, they are viewed as active, likely warm-blooded animals with complex social behaviors. How did this transformation take place? This course will examine the new ideas about dinosaurs and document how a variety of scientific studies have changed our perspective of them. Along the way, many different principles of biological science applicable to the study of dinosaurs will be discussed. A major theme of the class will be to examine how scientists working in a variety of disciplines can study and understand the nature and evolution of organisms long extinct.

This class is designed to be appropriate for undergraduates who are not majoring in biological sciences, though it should prove informative and challenging for biology majors.

COURSE GOALS

1. **Learn the basic principles and concepts guiding paleobiological study of life on earth.**
2. **Understand how paleobiology works as a science that tests hypotheses about extinct organisms and past environments.**
3. **Know the evolutionary origin and radiation of the dinosaur lineages, and develop an informed historical perspective of how dinosaurs have impacted life on earth.**
4. **Understand how aspects of the life of dinosaurs (and other extinct organisms) can be reconstructed using scientific methods**
5. **Be able to distinguish between science-based and non-science based opinions expressed in popular press accounts of dinosaur biology**

Learning objectives:

Students who have taken this course should be able to:

1. **Describe the basic geological history of the Earth and the evolution of life through the Mesozoic Era.**
2. **Explain the process of fossilization, the methods of fossil collection and preparation, and approaches to fossil interpretation.**
3. **Explain how paleobiological methods can reconstruct past environmental conditions (e.g., climate, etc.)**
4. **Describe the general history of dinosaur research, the major individuals involved and their contributions, and the role of personality in advancing (or hindering) our knowledge of dinosaurs.**
5. **Describe the evolutionary origin and radiation of the dinosaur lineages and explain the systematic methods used to determine their evolutionary relationships**
6. **Identify the major dinosaur taxa and describe their general way of life.**
7. **Explain scaling in nature and describe how size impacts the biology of organisms (such as dinosaurs).**
8. **Demonstrate how scaling and biomechanical techniques can be used to estimate body weights and locomotory abilities of dinosaurs**
9. **Explain the scientific evidence used to argue for or against endothermy in dinosaurs**
10. **Explain the fossil evidence underlying reconstructions of the reproductive and social behaviors of dinosaurs**
11. **Explain how sexual selection may be responsible for the evolution of many spectacular features of dinosaurs**
12. **Describe the evolution and biology of pterosaurs (the first flying vertebrates), and explain the biomechanical principles underlying the evolution of flight**
13. **Describe the evolution and biology of Mesozoic marine reptiles, and explain the evolutionary transformations involved in returning to life in the sea**
14. **Explain why birds actually are dinosaurs and how modern birds evolved**
15. **Discuss the scientific explanations for the great extinction event at the end of the Mesozoic Era**

Recommended Prerequisite:

3 hours of biological science or historical geology

Lectures:

This course is fully in person. It will meet Tuesdays and Thursdays in Pomerene Hall - Room: 160. If you cannot attend lecture it is recommended you get notes from other students. I do not take attendance but it is very important to regularly attend lecture

Textbook:
Finding an appropriate textbook for this class has been challenging. Dinosaur "textbooks" either tend to be too simplistic, too technical, or too idiosyncratic for the needs of this course. I have selected the paperback text **Dinosaurs: A Concise Natural History** by Fastovsky and Weishampel (3rd edition, 2016). Some aspects of the book are too detailed for this course (e.g., phylogenetic relationships of specific genera and skeletal features determining those relationships). On the other hand, my lectures frequently will include information not covered in the text. In many cases information that I discuss in one class period (e.g., analysis of fossil nests) is scattered throughout several chapters of the text. Should you buy the text? This is a very up-to-date book written by active dinosaur researchers, so if you want a good dinosaur book in your personal library, I would recommend it. On the other hand, my exams typically are based only on lecture material, and I plan to use the text largely as a reference book. If you attend lecture regularly, take good notes to supplement the powerpoint slides provided you, and understand the material, you probably can get by without the text. However, if you have limited familiarity with dinosaur taxonomy, evolution, and biology, the book should be very useful as a reference guide. Also, given that the book will serve mainly as a reference text, the 2nd edition may be adequate.

Popular media writing assignment:
An essay critiquing some popular media account of dinosaurs is on **Tuesday Nov. 23**. **YOU ARE ENCOURAGED TO TURN THE ESSAY IN EARLY IF YOU CAN.** The account can be an article, a movie, a TV show, etc. I want you to apply your knowledge of dinosaur biology to critically evaluate how realistically the dinosaur(s) are represented. What was accurate, highly speculative, unlikely, or blatantly wrong? Did the representation include outdated misperceptions about dinosaurs? Did the account include up-to-date information on dinosaur biology? **Focus your critique on information we have discussed in class that specifically concerns dinosaur biology (rather than just critique superficial, basic biological aspects that anyone might criticize).** If you use information from sources other than the course or textbook, provide references (in whatever format you prefer). The essay will be graded on content and also on organization and clarity of writing. Be sure to specify what article, film, etc. you are evaluating. Good essays need not to be more than about 3 (double-spaced) pages long. The assignment is worth 30 points.

Canvas:
Course information will be available to registered students on the carmen website (carmen.osu.edu). Lectures will consist of powerpoint presentations, and the powerpoint files (lacking some figures) of the presentations will be placed on carmen at least one day before the lecture. All students should download or print out the presentation before lecture; it will make taking additional notes easier. Other course information (syllabus, sample exam questions, references to new research articles on dinosaurs, etc.) also will be placed on canvas

Exams:
There will three exams (September 23, November 2, and December 7) worth 90 points each. There will be **no** final exam per se. The last (third) exam will be given during the last lecture period on December 7. The exams will not be cumulative, although information provided earlier in the course often will be relevant to material discussed later and covered on the second and third exams.

Exams are based only on lecture material and any specifically assigned readings. The exams will include a variety of types of questions, but will emphasize short answer essay questions. Sample exam questions will be posted on carmen so that students will have a good idea of what to expect on the exams. I will set aside blocks of time the day before and the day of the exam to meet with students who have questions concerning course material.

Make-up Exams:
If you are too ill to take an exam, please contact the instructor(s) no later than the **day of the exam**. You will need to supply written documentation from a physician for that illness prior to taking a make-up exam. If you anticipate having to miss an exam due to attendance at a university sanctioned event or other qualifying conflict, you must contact the instructor(s) at least one week in advance of the exam and supply written documentation signed by an appropriate official.

SCHEDULE OF CLASS TOPICS
Chapter #s represent relevant chapters from **Dinosaurs: A Concise Natural History** by Fastovsky and Weishampel (3rd edition, 2016). Often just certain parts of the chapters will be relevant to the material presented in that particular lecture. These chapters are not required, assigned reading, but reading them should help you prepare for lecture, provide a better understanding of the material, and increase the breadth of your knowledge about dinosaurs and biology as a whole. NOTE: lecture schedule subject to change but exam dates are *fixed*

AUGUST

24 Introduction and aims – Why study dinosaurs? The history of the study of dinosaurs (Chapters 2,15)

26 Review of the geological history of the earth and the evolution of life up to the Mesozoic - setting the stage for the dinosaurs (Chs.2,14)

31 Review of the geological history of the earth and the evolution of life up to the Mesozoic - setting the stage for the dinosaurs (contd) (Chs.2,14)

SEPTEMBER

2 Fossil formation, excavation, and interpretation (Chs.1,2)

7 Fossil formation, excavation, and interpretation (contd) (Chs.1,2)

9 Taphonomy – the study of the circumstances of fossil deposition and their relationship to the biology of fossil organisms; methods of reconstructing paleoclimates and environments

14 **The evolutionary origin and radiation of the dinosaurs; dinosaurs as "revolutionary" organisms (Chs. 4, 5, and 14).**

16 **The classification and phylogenetic relationships of dinosaurs; review of the Saurischian lineages (Chs. 5, 6, 7, and 9)**

21 **Review of the Ornithischian lineages (chapters 5, 10, 11, and 12)**

23 ****FIRST EXAM** ONLINE**

28 **Explaining the spectacular success of dinosaurs (good genes or good luck?); selecting living models for dinosaurs; The problem of size and scaling in nature (or how do you design really big animals?); understanding the evolution of large size is dinosaurs**

30 **How big were the largest dinosaurs? – methods of estimating body weights; how fast could dinosaurs move? - biomechanical methods of estimating athletic abilities**

OCTOBER

5 **The formation and interpretation of fossil trackways; reconstructing dinosaur movements and calculating speeds from fossil trackways**

7 **Warm-blooded dinosaurs? Reconstructing the metabolic strategies of dinosaurs (Ch. 13)**

12 **Warm-blooded dinosaurs? (contd) (Ch. 13)**

14 ***Autumn break (no class)***

19 **Studying the social behavior of extinct animals - evidence of herding and parental behavior in dinosaurs**

21 **Sexual selection and dinosaurs (parts of chapters 11 and 12)**

26 **Sexual selection and dinosaurs (contd) (parts of chapters 11 and 12)**

28 **Biology of the largest terrestrial animals to ever exist - the sauropods (Ch.9)**

NOVEMBER

2 ****SECOND EXAM** ONLINE**

4 **The biology of the largest terrestrial predators –the tyrannosaurids and other large theropods – active hunters or scavengers? (parts of chapters 6 and 7)**

9 **The remarkable dromaeosaurids (aka "raptors") – the dinosaurs that launched the revolution in dinosaur biology (parts of chapters 6 and 7)**

11 **NO CLASS-Veterans day**

16 **The Mesozoic battle tanks – biology of the Thyreophorans (Ch. 10)**

18 **The evolution and biology of the first and the largest flying vertebrates - the pterosaurs**

23 **The Mesozoic sea monsters - the ichthyosaurs, sauropterygians, and mosasaurs**

25 ***THANKSGIVING HOLIDAY (traditional meal of dinosaur)***

30 **Dinosaurs and the origin of birds (Ch 7)**

DECEMBER

2 **The great Cretaceous extinction - hypotheses and evidence (Ch.16)**

7 ****THIRD AND LAST EXAM ONLINE****

Note: There will be no final exam in this class, only three lecture exams (Sept. 24, Nov 3, and Dec. 3).

Accommodations for students with disabilities:

The university strives to make all learning experiences as accessible as possible. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's request process (**slds.osu.edu/covid-19-info/covid-related-accommodation-requests/**), managed by Student Life Disability Services. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: **slds@osu.edu**; 614-292-3307; **slds.osu.edu**; 098 Baker Hall, 113 W. 12th Avenue.

Academic Misconduct:

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's Code of Student Conduct, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow

the rules and guidelines established in the University's Code of Student Conduct and this syllabus may constitute Academic Misconduct.

The Ohio State University's Code of Student Conduct (Section 3335-23-04) defines academic misconduct as: Any activity that tends to compromise the academic integrity of the University, or subvert the educational process. Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's Code of Student Conduct is never considered an excuse for academic misconduct, so I recommend that you review the Code of Student Conduct and, specifically, the sections dealing with academic misconduct.

If I suspect that a student has committed academic misconduct in this course, I am obligated by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

QUIZZES AND EXAMS

You must complete the midterm and final exams yourself, without any external help or communication. Weekly quizzes are included as self-checks without points attached.

WRITTEN ASSIGNMENTS

Your written assignments, including discussion posts, should be your own original work. In formal assignments, you should follow [MLA/APA/?] style to cite the ideas and words of your research sources. You are encouraged to ask a trusted person to proofread your assignments before you turn them in--but no one else should revise or rewrite your work.

REUSING PAST WORK

In general, you are prohibited in university courses from turning in work from a past class to your current class, even if you modify it. If you want to build on past research or revisit a topic you've explored in previous courses, please discuss the situation with me.

FALSIFYING RESEARCH OR RESULTS

All research you will conduct in this course is intended to be a learning experience; you should never feel tempted to make your results or your library research look more successful than it was.

COLLABORATION AND INFORMAL PEER-REVIEW

The course includes many opportunities for formal collaboration with your classmates. While study groups and peer-review of major written projects is encouraged, remember that comparing answers on a quiz or assignment is not permitted. If you're unsure about a particular situation, please feel free just to ask ahead of time.

GROUP PROJECTS

This course includes group projects, which can be stressful for students when it comes to dividing work, taking credit, and receiving grades and feedback. I have attempted to make the guidelines for group work as clear as possible for each activity and assignment, but please let me know if you have any questions.