

# BIOLOGY 830P

## The Six Global Mass Extinctions

### Summer 2024

Professor **Bryan Drew** (344 Bruner Hall of Science). Molecular systematics; biogeography; speciation; phylogenetics of Lamiaceae; • 308-865-8883 • [drewbt@unk.edu](mailto:drewbt@unk.edu)

#### Course Materials:

- Readings: Select Primary Literature
- Announcements, quizzes, test, discussion boards, and research project: All information for this class will be available on Canvas.
- E-mail: All students must use their UNK email account so that I can reach them.

**Schedule:** This class is a graduate level class, therefore I assume that all of you have had a Biology course that covered introductory material at some point in your career. This schedule is subject to change.

	Date	Topic	Assignment/Reading*
Week 1	June 3-7	Introduction to Mass Extinctions Causes of Mass extinctions	Crowley & North 1988; Hut et al. Nature 1987; Racki & Wrzolek 2001; Wignall 2001; Piran & Jimenez 2014
Week 2	June 10-14	The Ordovician-Silurian extinction The Late Devonian extinction	Darroch et al. 2015; Sheehan 2001; McGhee 1988; Sallan & Galimberti 2015;
Week 3	June 17-21	The Permian-Triassic extinction The Permian-Triassic extinction 2	Vajda & McLoughlin; National Geographic 2000; Benton 2003; Kunio et al 2011; Visscher 1996 (skim for perspective); Twitchett 2007 (again skim); Sahney 2008; Visscher 2011; Sidor 2013
Week 4	June 24-28	The End Triassic extinction The Capitanian event, a 7 <sup>th</sup> extinction? <b>Midterm</b>	Mander 2010; Tanner et al. 2004; Bond et al. 2015; link to press release

Week 5	July 1-5	The Cretaceous-Tertiary extinction (K-T, or K-Pg) The Cretaceous-Tertiary extinction 2	Merideth 2012; Hildebrand 1991; Alvarez 1980; Fawcett 2009; Sibert 2015
Week 6	July 8-12	The Cretaceous-Tertiary extinction 3 The Holocene (Anthropocene) extinction	Vanneste 2014; Claramunt 2015; Rosenzweig 2003; Rabosky 2016
Week 7	July 15-19	The Holocene (Anthropocene) 2 The Holocene (Anthropocene) 3 <b>Research Paper Due (July 17<sup>th</sup>)</b>	Erwin 1982; Faith 2009; Miller 2009; Barnosky et al. 2011; Brook et al. 2006; Rockstrom et al 2009; Ceballos et al. 2015
Week 8	July 22-26	Final Exam	

\*Readings will be assigned

**Course Description:** Mass extinction events are directly and indirectly responsible for what the Earth looks like today in terms of both organismal composition and distribution; it is estimated that well over 99% of organisms that once existed on Earth have gone extinct. These events have occurred several times during the past 500 million years, with varying causes, intensities, and lingering impacts. We will examine each mass extinction in detail, including the current putative “6<sup>th</sup> Extinction”, evaluating and discussing the cause, effect, and lasting impact of each. Special focus will be paid to the Permian, K-Pg, and Holocene extinctions due to their magnitude/recency.

**Course Objectives:**

- Understand mechanisms behind mass extinctions
- Learn what Earth looked like before and after each global mass extinction
- Write a research paper demonstrating an understanding of the impacts mass extinctions have had on extant biodiversity

**Discussion Boards:** Discussion posts will be given weekly and largely based on readings.

<b>GRADES:</b>	Midterm Exam	20%
	Final Exam	20%
	Discussion Board	40%
	Research Project	20%

**Research Paper:** As part of this course you will be required to write a scientific paper in a scientific format.

The grading scale used for this class is as follows:

A (92-100%), A- (90-91%), B+ (88-89%), B (82-87%), B- (80-81%), C+ (78-79%), C (73-77%), C- (70-72%), D+ (68-69%), D (63-67%), D- (60-62%), and F (below 60%).

**Plagiarism and cheating:** Anyone found plagiarizing or cheating will receive a 0 for that assignment; subsequent violations will result in referral to the Vice Chancellor for Academic Affairs for dismissal from the university (see below for what constitutes **Plagiarism**).

### **Finals Week Policy**

The final exam will be administered in the time period scheduled during finals week in accordance with University policy ([Final Exam Schedule](#)). More information about UNK's Finals Week Policy, including when it is appropriate to ask for special accommodations to move a course's final exam, can be found here: [Finals Week Policy](#).

### **Reporting Student Sexual Harassment, Sexual Violence or Sexual Assault**

Reporting allegations of rape, domestic violence, dating violence, sexual assault, sexual harassment, and stalking enables the University to promptly provide support to the impacted student(s), and to take appropriate action to prevent a recurrence of such sexual misconduct and protect the campus community. Confidentiality will be respected to the greatest degree possible. Any student who believes they may be the victim of sexual misconduct is encouraged to report to one or more of the following resources:

- **Local Domestic Violence, Sexual Assault Advocacy Agency** 308-237-2599
- **Campus Police (or Security)** 308-865-8911
- **Title IX Coordinator** 308-865-8655

Retaliation against the student making the report, whether by students or University employees, will not be tolerated.

### **Students with Disabilities**

It is the policy of the University of Nebraska at Kearney to provide flexible and individualized reasonable accommodation to students with documented disabilities. To receive accommodation services for a disability, students must be registered with the UNK Disabilities Services for Students (DSS) office, 175 Memorial Student Affairs Building, 308-865-8214 or by email [unkdso@unk.edu](mailto:unkdso@unk.edu)

### **Students Who are Pregnant**

It is the policy of the University of Nebraska at Kearney to provide flexible and individualized reasonable accommodation to students who are pregnant. To receive accommodation services due to pregnancy, students must contact the Student Health office at 308.865.8218. The following links provide information for students and faculty regarding pregnancy rights. <https://thepregnantscholar.org/title-ix-basics/>

<https://nwlc.org/resource/faq-pregnant-and-parenting-college-graduate-students-rights/>

## **UNK Statement of Diversity & Inclusion**

UNK stands in solidarity and unity with our students of color, our Latinx and international students, our LGBTQIA+ students and students from other marginalized groups in opposition to racism and prejudice in any form, wherever it may exist. It is the job of institutions of higher education, indeed their duty, to provide a haven for the safe and meaningful exchange of ideas and to support peaceful disagreement and discussion. In our classes, we strive to maintain a positive learning environment based upon open communication and mutual respect. UNK does not discriminate on the basis of race, color, national origin, age, religion, sex, gender, sexual orientation, disability or political affiliation. Respect for the diversity of our backgrounds and varied life experiences is essential to learning from our similarities as well as our differences. The following link provides resources and other information regarding

D&I: <https://www.unk.edu/about/equity-access-diversity.php>

## **Veterans Services**

UNK works diligently to support UNK's military community by providing military and veteran students and families with resources and services to help them succeed. Veterans Services assists with the GI Bill process and acts as a liaison between the student and the Veterans Administration. If you need assistance or would like more information, please contact Lori Weed Skarka at 308-865-8520 or [unkveterans@unk.edu](mailto:unkveterans@unk.edu).

## **Copyright Law and Compliance**

The materials on the course website are only for the use of students enrolled in this course for purposes associated with this course and may not be retained or further disseminated. The materials on this course website may be protected by copyright, and any further use of this material may be in violation of federal copyright law.

## **Plagiarism**

Plagiarism is defined as taking any sequence of more than three words without proper citation. Taking an idea or image (photograph, table, or graph) without proper citation is also plagiarism and may violate copyright laws. The UNK graduate catalog <http://catalog.unk.edu/graduate/academics/academic-regulations/expectations-in-the-classroom/> gives the UNK perspective on this. There are levels of plagiarism:

- a. **Simple plagiarism**: Copying sentences verbatim or taking figures without citation is the most blatant form of plagiarism. Using the ideas of another to support an argument without citing the source of those ideas is another form of simple plagiarism, regardless of whether the wording is verbatim or has been paraphrased.
- b. **Under-citation**:
  - i. If you write a paragraph and only cite the last sentence but used more than one source for that paragraph, you have under-cited.

- ii. If you include a source in the list of references at the end of the paper but do not cite that source within the text (within the sentence where the material was used), you have under-cited.
- c. Mis-citation:
- i. Indirect citation is when you cite a source that was cited by the source you actually read.
  - ii. Citing the wrong source is when you state that some material came from Jones (2004) but it really came from Smith (2003).
  - iii. Incorrectly citing the source is when you give an incomplete or inaccurate reference that, if followed, does not lead the reader to the source material. Citing web pages requires very careful listing of the URL. One misplaced character can lead to a dead end rather than the correct source. If you direct the reader to a web page that LEADS to the source, that web page *is not* your source; the ultimate page *is*. That is the URL you should use.

If it is found that you have committed plagiarism, you will receive a zero for the assignment. We will maintain a list of offenders and if plagiarism occurs in another class it will be considered a repeat offense. The Senior Vice-Chancellor of Academic Affairs also keeps records of students who commit academic dishonesty.