

Term Information

Effective Term Autumn 2022
Previous Value Autumn 2015

Course Change Information

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

Incorporation of course in Origins and Evolution Theme.

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

The course meets ELOs for the Origins and Evolution Theme.

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 request 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	Anthropology
Fiscal Unit/Academic Org	Anthropology - D0711
College/Academic Group	Arts and Sciences
Level/Career	Undergraduate
Course Number/Catalog	3409
Course Title	Primate Evolution
Transcript Abbreviation	Primate Evolution
Course Description	Examination of the origin, radiation, and (in some cases) extinction of each primate clade including prosimians, New World monkeys, Old World monkeys, apes, and humans.
Semester Credit Hours/Units	Fixed: 3

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, Wooster
<i>Previous Value</i>	<i>Columbus</i>

Prerequisites and Exclusions

Prerequisites/Corequisites

Exclusions

[Previous Value](#)

Not open to students with credit for 409.

Electronically Enforced

No

Cross-Listings

Cross-Listings

Subject/CIP Code

Subject/CIP Code

26.1303

Subsidy Level

Baccalaureate Course

Intended Rank

Freshman, Sophomore, Junior, Senior

Requirement/Elective Designation

Origins and Evolution

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

[Previous Value](#)

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

- This course will familiarize students with the evolutionary history of each primate lineage.
- Students will identify the principle adaptive changes that characterize each lineage.
- Students will demonstrate how genealogical evidence is used to clarify relationships among living primates.
- Students will establish the phylogenetic context and selective environment for the origin and radiation of early hominids.

Content Topic List

- Prosimians
- New world monkey
- Old world monkey
- Apes
- Adaptation
- Hominids
- Fossil record
- Paleocene
- Paleobiology
- Diet
- Africa
- Thailand

COURSE CHANGE REQUEST
3409 - Status: PENDING

Last Updated: Vankeerbergen, Bernadette
Chantal
06/15/2022

Sought Concurrence

No

Attachments

- Anthropology 3409 Primate OE.docx: Theme Submission Questions for Anth 3300

(Other Supporting Documentation. Owner: Guatelli-Steinberg, Debra)

- Anthropology 3409 Primate Evolution Syllabus Revised.doc: Syllabus

(Syllabus. Owner: Guatelli-Steinberg, Debra)

Comments

Workflow Information

Status	User(s)	Date/Time	Step
Submitted	Guatelli-Steinberg, Debra	06/07/2022 02:45 PM	Submitted for Approval
Approved	Guatelli-Steinberg, Debra	06/07/2022 02:50 PM	Unit Approval
Approved	Vankeerbergen, Bernadette Chantal	06/15/2022 02:26 PM	College Approval
Pending Approval	Cody, Emily Kathryn Jenkins, Mary Ellen Bigler Hanlin, Deborah Kay Hilty, Michael Vankeerbergen, Bernadette Chantal Steele, Rachel Lea	06/15/2022 02:26 PM	ASCCAO Approval

Primate Evolution
Anthropology 3409
Spring 2022

Course Meets M,W,F from 11:30 – 12:25 in 4025 Smith Lab

Instructor: W. Scott McGraw
Office: 4064 Smith Laboratory
Tel: 688-3794
Email: mcgraw.43@osu.edu

Office Hours: Monday & Wednesday, 2:30 – 4:00 pm (and by appointment)

Required Text: *Primate Adaptation and Evolution* (3rd edition) by JG Fleagle

This course is a core course in the Evolutionary Studies minor. Information regarding the minor and its requirements may be found online at <http://artsandsciences.osu.edu/interdisciplinary>.

Course Content: This course focuses on the approximately 65 million years of primate evolution. We begin with an overview of living primate groups and the features that define them. The core of the course consists of a systematic examination of the origin, radiation and (in some cases) extinction of each major primate lineage including prosimians, New World monkeys, Old World monkeys and apes. After critically examining evidence pertaining to the divergence of hominids from their ape relatives, we conclude with a summary of major patterns and trends in primate evolution.

Course Objectives: The course goals are fourfold: (1) familiarize students with the evolutionary history of each primate lineage, (2) identify the principal adaptive changes that characterize each lineage, (3) demonstrate how genealogical evidence is used to clarify relationships among living primates, (4) establish the phylogenetic context and selective environment for the origin and radiation of early hominids.

This course can be used to satisfy *Origins and Evolution* GE Theme. The goals of this theme are as follows:

1. Successful students will analyze the origins and evolution of natural systems, life, humanity, or human culture at a more advanced and in-depth level than in the Foundations component.
2. Successful students will integrate approaches to the origins and evolution of natural systems, life, humanity, or human culture by making connections to their own experiences and by making connections to work they have done in previous classes and/or anticipate doing in the future.
3. Successful students will appreciate the time depth of the origins and evolution of natural systems, life, humanity, or human culture, and the factors that have shaped them over time.
4. Successful students will understand the origins and evolution of natural systems, life, humanity, or human culture, and the factors that have shaped them over time.

More specifically, the Expected Learning Outcomes for this theme are: Successful students are able to:

- 1.1 Apply their understanding of scientific methods to quantitative calculations.
- 1.2 Engage in critical and logical thinking about the origins and evolution of the universe, physical systems, life on earth, humanity, or human culture.
- 2.1 Identify, describe, and synthesize approaches to or experiences of origins and evolution questions in different academic and non-academic contexts.
- 2.2 Demonstrate a developing sense of self as a learner through reflection, self-assessment, and creative work, building on prior experiences to respond to new and challenging contexts.
- 3.1 Illustrate the time depth of the universe, physical systems, life on earth, humanity, or human culture by providing examples or models.
- 3.2 Explain scientific methods used to reconstruct the history of the universe, physical systems, life on earth, humanity, or human culture and specify their domains of validity.
- 3.3 Engage with current controversies and problems related to origins and evolution questions.
- 4.1 Describe how the universe, physical systems, life on earth, humanity, or human culture have evolved over time.
- 4.2 Summarize current theories of the origin and evolution of the universe, physical systems, life on earth, humanity, or human culture.

Anthropology 3409 addresses the origin and evolution of primates, the Mammalian order to which humans belong. Through interactive lectures, discussions, and readings, students engage in critical and logical thinking about the origins of the primate order and the diversification of primates over the last 65 million years of evolutionary history. Beyond lecture, students actively engage in critical and logical thinking in a series of five major discussions, in their capstone term papers and in their paper presentations/discussions during the two-week **Symposium on Primate Evolution** that we hold during the final two weeks of the course. The five major discussions relate to debates and controversies that are discussed in their text and in lecture. These discussions require students to evaluate evidence (paleontological, neontological and molecular) as well as the logic of arguments/hypotheses about: (1) The origins of primates – when, where, and how, (2) The taxonomic status of adapoids (here we view and critique the a video documentary on the famous 47 million year-old fossil Ida), (3) Molecular and Fossil evidence relating to the origins of anthropoids (the group that comprises humans, apes and monkeys), (4) The origins of Central and South American monkeys, and (5) The origins of the hominin lineage from Miocene ape precursors.

Course Requirements: Your final grade will be based on seven scores: six exams and a paper to be presented orally. The first two exams (quizzes) each contribute 5% to your final grade. The next three exams each constitute 20% of your final grade. The last exam (written by you) contributes 10% to your final grade. Exams are not comprehensive; however, they obviously build off previous material. If you miss an exam you have 24 hours to contact me. Official documentation is required (doctor's excuse, accident report, etc.) for make-ups. All make-up exams must be taken within 2 days of the regularly scheduled exam – there are no exceptions. Otherwise, the student will receive an "O" for that exam. Exams are based on lectures, the text, discussion and films. The university takes a serious view of cheating, and should any student engage in this practice during the course of any test, his/her paper will be canceled to a mark of zero, and a report will be made to the administration. The final component of your grade is a

paper/oral presentation which contributes 20% to your final grade. The paper is to be between 6 and 8 pages in length (excluding references) and can be written on any topic pertaining to primate evolution as long as it is approved by me. Paper topics must be approved by **March 13th**. Each student will give a short (~ 10 minute) oral presentation on the paper contents during the last weeks of class.

Grading: Final grades will be distributed as follows: A (92-100), A- (90-91), B+ (88-89), B (82-87), B- (80-81), C+ (78-79), C (72-77), C-(70-71), D+ (68-69), D (60-67), E < 60.

University Policies and Information:

Academic Misconduct

It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. The term “academic misconduct” includes all forms of student academic misconduct wherever committed; illustrated by, but not limited to, cases of plagiarism and dishonest practices in connection with examinations. Instructors shall report all instances of alleged academic misconduct to the committee (Faculty Rule 3335-5-487). For additional information, see the Code of Student Conduct <http://studentlife.osu.edu/csc/>.

Disability Services

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. 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.

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. The Ohio State University offers services to assist you with addressing these and other concerns you may be experiencing. If you or someone you know are suffering from any of the aforementioned conditions, you can learn more about the broad range of confidential mental health services available on campus via the Office of Student Life’s Counseling and Consultation Service (CCS) by visiting ccs.osu.edu or calling [614-292-5766](tel:614-292-5766). CCS is located on the 4th Floor of the Younkin Success Center and 10th Floor of Lincoln Tower. You can reach an on call counselor when CCS is closed at [614-292-5766](tel:614-292-5766) and 24 hour emergency help is also available through the 24/7 National Suicide Prevention Hotline at 1-800-273-TALK or at suicidepreventionlifeline.org.

Sexual Misconduct

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories (e.g., race). If you or someone you know has been

sexually harassed or assaulted, you may find the appropriate resources at <http://titleix.osu.edu> or by contacting the Ohio State Title IX Coordinator, Kellie Brennan, at titleix@osu.edu

Diversity

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.

SYLLABUS

January 12 (Mon)	Course Mechanics & Defining Primates Reading: chapters 1-3, 9
January 14 (Wed)	Primate Anatomy and Adaptation Reading: chapters 1-3, 9
January 16 (Fri)	Primate Anatomy and Adaptation Reading: chapters 1-3, 9
January 19 (Mon)	No Class
January 21 (Wed)	Extant prosimians and their relationships Chapter 4
January 23 (Fri)	Extant prosimians and their relationships Chapter 4
January 26 (Mon)	Exam counting for 5%
January 28 (Wed)	What is an anthropoid? New World monkeys I Chapter 5
January 30 (Fri)	New World monkeys II Chapter 5
February 2 (Mon)	Old World monkeys I Chapter 6
February 4 (Wed)	Old World monkeys II, Apes I Chapters 6, 7

February 6 (Fri)	Apes II Chapter 7
February 9 (Mon)	Review
February 11 (Wed)	Exam counting for 5%
February 13 (Fri)	Primate Origins Chapters 10, 11
February 16 (Mon)	Discussion 1: When, why and how did primates first evolve? Evaluate molecular and fossil evidence for the origins of primates. Chapters 10, 11
February 18 (Wed)	Fossil Prosimians I Chapter 12
February 20 (Fri)	Fossil Prosimians II Chapter 12
February 23 (Mon)	Discussion 2: Who was IDA? Evaluate the discoverers' arguments about Ida's relationship to later primates. Chapter 12
February 25 (Wed)	Subfossil Lemurs pp. 73-83
February 27 (Fri)	Review
March 2 (Mon)	Exam counting for 20%
March 4 (Wed)	Early Anthropoids Chapter 13
March 6 (Fri)	Discussion 3: Evaluate neontological and paleontological evidence relating to the Tarsier, Omomyoid, and Adapoid origin hypotheses. Chapter 13
March 9 (Mon)	Fossil Platyrrhines Chapter 14
March 11 (Wed)	Fossil Platyrrhines Chapter 14

March 13 (Fri) Primitive Catarrhines & Fossil Old World monkeys
pp. 311-313, chapter 16 (Paper topics due)

March 16 (Mon) Spring Break

March 18 (Wed) Spring Break

March 20 (Fri) Spring Break

March 23 (Mon) **Discussion 4 : Evaluate hypotheses about platyrrhine origins based on paleontological, molecular, paleogeographic evidence.**

March 25 (Wed) Fossil Old World monkeys
Chapter 16

March 27 (Fri) Review

March 30 (Mon) Exam counting for 20%

April 1 (Wed) Exam counting for 20%

April 3 (Fri) Fossil Apes
Chapter 15

April 6 (Mon) Fossil Apes
Chapter 15

April 8 (Wed) **Discussion 5 : Which Miocene hominoid species is the most likely candidate ancestor of African apes and hominins?**

April 10 (Fri) Bipedality & the earliest hominins

April 13 (Mon) Review

April 15 (Wed) Exam counting for 20%

April 17 (Fri) **Primate Evolution Symposium: Class Presentations**

April 20 (Mon) **Primate Evolution Symposium: Class Presentations**

April 22 (Wed) **Primate Evolution Symposium: Class Presentations**

April 24 (Fri) **Primate Evolution Symposium: Class Presentations**

April 27 (Mon) Exam counting for 10%

Symposium on Primate Evolution
Guidelines for Paper and Class Presentation: Anthro 3409

NB: The paper contributes 20% to your overall course grade.

Pick a topic pertaining to any aspect of primate evolution. Choose something that interests you! Your topic needs to be approved by me **on or before March 13th**. This can be done via email or by writing your topic on paper and submitting it to me. Be as specific as possible: "I am writing on fossil apes" (for example) is not sufficient. The text of the paper is to be between 6 and 8 pages (excluding references), typed and double-spaced. It should include a minimum of five (5) references to be listed on a separate page(s). No more than two of these sources can come from the internet. These references can be drawn from a variety of sources including journals, books, internet, etc. The OSU libraries carry many books and journals pertaining to primates. Among the leading journals are:

American Journal of Primatology
International Journal of Primatology
Folia Primatologica
Primates
American Journal of Physical Anthropology
Evolutionary Anthropology
Animal Behavior
Journal of Vertebrate Paleontology
Paleobiology
Science
Nature

Many of these journals are in the Anthro reading room of Smith Laboratory and/or can be downloaded from the internet (via **OhioLink**). Make sure to properly cite all thoughts and ideas that are not your own. I encourage you to be critical in what you write. Rather than regurgitate what others have written, pick a topic and evaluate it. The presentation to the class should be brief (~10 minutes) and will be followed by a short discussion (with questions). When all topics and titles are finalized, I'll create a schedule so you know what day your paper will be presented.

Sample Topics and Titles:

The Diet of Extinct Baboons
Did *Proconsul* Have A Tail?
The Phyletic Position of *Notharctus*
The Locomotor Behavior of *Aegyptopithecus*
Sexual Dimorphism in Miocene Apes
Gigantopithecus and Bigfoot
The Behavior and Ecology of *Stirtonia*

Hints: Try and write the paper early, set it aside for a few days and then read it again... critically. Give it to a friend and have him/her critique it: a well-written paper should be intelligible to someone who has not taken this class. Run the spell check. Come to me with questions, problems, etc. I will help in any way I can.

Paper and Class Presentation Scoring

Class Presentation (20%)

- Organization
- Speaking Clarity
- Content
- Proper setting of topic
- Conclusion

Research Paper (80%)

- Organization of text
- Literature review
- Critical thinking
- Thoroughness of research
- Conclusions
- Grammar & spelling

You may hand in your paper at any time, but all papers must be turned in no later than 12:25 pm on April 24th. No excuses. You will be penalized 15 percentage points for every day your paper is late and papers are considered late beginning at 12:26 pm on 4/24/14. Plan for unanticipated problems such as empty printer cartridges, flat tires, etc. In addition to your paper, all students will hand in one question based on their class presentation for inclusion on the final exam. Put this question on a separate piece of paper with your name on it. Be sure to attend all class presentations as YOU are writing the final exam.

12th Annual Symposium on Primate Evolution



Tuesday April 1st

[REDACTED]

Rafting and the evolution of proto-platyrrhines

[REDACTED]

Evolution of the Owl Monkey

[REDACTED]

The idea of a 'missing link.'

[REDACTED]

Chris Beard, Elwyn Simons and Anthropoid Origins

[REDACTED]

The temporal region in platyrrhines and catarrhines

[REDACTED]

Evolution of orangutans

[REDACTED]

Gigantopithecus

Thursday April 3rd

[REDACTED]

Daubentonia robusta

[REDACTED]

Darwinius

[REDACTED]

The mangabey-mandrill-baboon problem

[REDACTED]

Evolutionary processes and silverback gorillas

[REDACTED]

Apidium the rafter

[REDACTED]

Evolution of brachiation

[REDACTED]

The origin of platyrrhines

Tuesday April 15th

██████████

Biogeography of fossil baboons

██████████

The relationship between orangutans and *Gigantopithecus*

██████████████████

Evolution of leaping in primates

██████████████

Evolution of polyandry

██████████████

Selective hybridization in platyrrhines

██████████

Ekgmowechashala!

██████████████

Two morphologies of male orangutans

Thursday April 17th

██████████████

Rooneyia!

██████████████████

Comparison of two fossil colobines from Africa

██████████████

Primate fossils in the popular media

██████████████

Oreopithecus bambolii

██████████

Evolution of hemispheric specialization in primates

██████████████

Evolution of secondary sexual characteristics in male primates

██████████████

Evolution of *Tarsius*

Anthropology 3409: Primate Evolution

Submitted for approval for the new theme Origins and Evolution

Background: Anthropology 3409

This course focuses on the approximately 65 million years' worth of primate evolution. We begin with an overview of living primate groups and the features that define them. The core of the course consists of a systematic examination of the origin, radiation and (in some cases) extinction of each major primate lineage including prosimians, New World monkeys, Old World monkeys and apes. After critically examining evidence pertaining to the divergence of hominids from their ape relatives, we conclude with a summary of major patterns and trends in primate evolution.

Expected learning outcomes specific to the course:

The course goals are fourfold: (1) familiarize students with the evolutionary history of each primate lineage, (2) identify the principal adaptive changes that characterize each lineage, (3) demonstrate how genealogical evidence is used to clarify relationships among living primates, (4) establish the phylogenetic context and selective environment for the origin and radiation of early hominids.

(I) How Anthropology 3409 meets ELOs shared by all themes

<p>ELO 1.1 Engage in critical and logical thinking.</p>	<p>Students engage in critical and logical thinking about the origins of primates and primate evolution throughout this course. Beyond lecture, students actively engage in critical and logical thinking in a series of five major discussions, in their capstone term papers and in their paper presentations/discussions during the two-week Symposium on Primate Evolution that we hold during the final two weeks of the course. The five major discussions relate to debates and controversies that are discussed in their text and in lecture. These discussions require students to evaluate evidence (paleontological, neontological and molecular) as well as the logic of arguments/hypotheses about: (1) The origins of primates – when, where, and how, (2) The taxonomic status of adapoids (here we view and critique the a video documentary on the famous 47 million year-old fossil Ida), (3) Molecular and Fossil evidence relating to the origins of anthropoids (the group that comprises humans, apes and monkeys), (4) The origins of Central and South American monkeys, and (5) The origins of the African ape/hominin lineage from Miocene ape precursors. The latter includes critical</p>
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	<p>examination of several popular and controversial topics, such as the existence of “Bigfoot” as biological phenomenon (e.g., a relic hominoid very good at hiding) or as a cultural myth.</p> <p>During the class’s two-week Primate Evolution Symposium, students discuss their classmates’ terms papers. The topics of these papers (for an example see page 9 of the syllabus) involve critical and logical thinking about evidence and arguments relating to questions, controversies, and debates in primate evolution.</p>
<p>ELO 2.1 Identify, describe, and synthesize approaches or experiences.</p>	<p>Students are asked to identify and describe and synthesize approaches throughout the course. For example, when we discuss the fossil Ida (a spectacular adapid fossil known as <i>Darwinius masillae</i>), students are asked to identify what sorts of approaches are used to reconstruct this fossil’s paleobiology and, based on these different approaches (e.g., studies of gut contents, dental development, and functional morphology of the skeleton), what can we say about how Ida lived? How fast did she grow? What did she eat? How did she move around in the trees? Here, as elsewhere we also discuss popular media coverage and thus consider how Ida is perceived in non-academic contexts. Given the way Ida was presented to the public as “The Link,” I ask students to consider how Ida might be perceived in non-academic contexts and the backlash that can occur when scientists exaggerate the significance of discoveries.</p>
<p>ELO 2.2 Demonstrate a developing sense of self as a learner through reflection, self-assessment, and creative work, building on prior experiences to respond to new and challenging contexts.</p>	<p>This ELO is identical to the general theme ELO 2.2. Students often find discussing matters of evolution difficult, particularly when discussion involves our nonhuman ancestors (“My parents will disown me if I told them we evolved from monkeys!”). The course is designed to establish foundational knowledge and conceptual understandings that are then applied to the challenging contexts students confront in discussions and in their capstone papers for the Primate Evolution Symposium. Thus, for example, when we discuss the origins of primates, students must use their knowledge of molecular and fossil evidence to evaluate various hypotheses and candidate ancestors. This is just one way that students discover how their previous learning can be applied to new and challenging contexts. Our two-week Primate Evolution Symposium generates a great deal of discussion, during which students gain a sense of themselves as learners that can offer informed evaluations of debates and controversies in primate evolution. This exercise, designed to challenge conventional thinking in non-threatening ways, promotes confidence and personal growth.</p>

(I) How Anthropology 3300 meets ELOs of the Origins and Evolution Theme.

<p>ELO 1.1 Apply their understanding of scientific methods to quantitative calculations.</p>	<p>In interactive lectures, students apply their understanding of scientific methods to quantitative calculations. For example, when we cover chronological dating methods in lecture, students break into pairs to calculate the age of a primate fossil. During discussions of limb anatomy and locomotion (e.g., how the primate body evolved to maximize leaping behavior, or arm-swinging, or bipedality), students are asked to calculate the biomechanical advantage of a muscle based on where that muscle attaches in living and fossil forms.</p>
<p>ELO 1.2 Engage in critical and logical thinking about the origins and evolution of the universe, physical systems, life on earth, humanity, or human culture.</p>	<p>Students engage in critical and logical thinking about the origins of primates and primate evolution throughout this course: where, when, why and how did primates evolve? Are we ancient or relatively recent lineage? Did our evolution occur rapidly, gradually, or in a series of bursts? In exploring these and other “big picture” questions, students actively engage in critical and logical thinking in a series of five major discussions, in their capstone term papers and in their paper presentations/discussions during the two-week Symposium on Primate Evolution that we hold during the final two weeks of the course. The five major discussions relate to debates and controversies that are discussed in their text and in lecture. These discussions require students to evaluate evidence (paleontological, neontological, and molecular) as well as the logic of arguments/hypotheses about: (1) The origins of primates – when, where, and how, (2) The taxonomic status of the first true primates (Adapoids and Omomyoids) (here we view and critique the a video documentary on the famous 47 million year-old fossil Ida), (3) Molecular and Fossil evidence relating to the origins of anthropoids (the group that comprises humans, apes and monkeys), (4) The origins of Central and South American monkeys, and (5) The origins of the African ape/hominin lineage from Miocene ape precursors.</p> <p>During the class’s two-week Primate Evolution Symposium, students discuss their classmates’ terms papers. The topics of these papers (for an example see page 9 of the syllabus) involve critical and logical thinking about evidence and arguments relating to questions, controversies, and debates in primate evolution.</p>

<p>ELO 2.1 Identify, describe, and synthesize approaches to or experiences of origins and evolution questions in different academic and non-academic contexts.</p>	<p>Students are asked to identify and describe and synthesize approaches throughout the course. For example, when we discuss the fossil Ida, students are asked to identify what sorts of approaches are used to reconstruct this fossil's paleobiology and, based on these different approaches (studies of gut contents, dental development, and functional morphology of the skeleton), what can we say about how Ida lived? How fast did she grow? What did she eat? How did she move around in the trees? Here, as elsewhere we also discuss popular media coverage and thus consider how Ida is perceived in non-academic contexts. Given the way Ida was presented to the public as "The Link," I ask students to consider how Ida might be perceived in non-academic contexts. In another example, we discuss why the lemurs of Madagascar have remained essentially unchanged for 50 million years while their relatives on mainland Africa either went extinct or underwent a evolutionary transformation.</p>
<p>ELO 2.2 Demonstrate a developing sense of self as a learner through reflection, self-assessment, and creative work, building on prior experiences to respond to new and challenging contexts.</p>	<p>This ELO is identical to the general theme ELO 2.2. The course is designed to establish foundational knowledge and conceptual understandings that are then applied to the challenging contexts students confront in discussions and in their capstone papers for the Primate Evolution Symposium. Thus, for example, when we discuss the origins of primates, students must use their knowledge of molecular and fossil evidence to evaluate various hypotheses and candidate ancestors. This is just one way that students discover how their previous learning can be applied to new and challenging contexts. Our two-week Primate Evolution Symposium generates a great deal of discussion, during which students gain a sense of themselves as learners that can offer informed evaluations of debates and controversies in primate evolution.</p>
<p>ELO 3.1 Illustrate the time depth of the universe, physical systems, life on earth, humanity, or human culture by providing examples or models.</p>	<p>Illustrating the time depth of primates is something we do throughout the course, especially in our five major discussions. At the start of each discussion, students are asked to illustrate, on a timeline, the time period that our discussion covers. For example, over what time period did Miocene apes evolve? They are asked to place key Miocene ape species on that timeline with respect to their first and last appearance in the fossil record.</p>
<p>ELO 3.2 Explain scientific methods used to reconstruct the history of the universe, physical systems, life on earth, humanity,</p>	<p>Students must explain methods used to reconstruct primate evolutionary history on their exams. Here, they are asked to use their knowledge from lecture and from the readings to explain how, for example, it is possible</p>

<p>or human culture and specify their domains of validity.</p>	<p>to reconstruct ancestral environments. What methods of analysis can be used to do this and what exactly do each of these methods tell us ? As another example, on exams, students must use their understanding of primate anatomy to analyze a diverse array of primate locomotor behaviors. They are required to recognize what aspects of locomotor behavior can be validly reconstructed from an understanding of primate locomotor anatomy.</p>
<p>ELO 3.3 Engage with current controversies and problems related to origins and evolution questions.</p>	<p>The five major discussions and the Primate Evolution Symposium require students to engage with controversies and problems related to origins and evolution questions. The readings for the major discussions in the Fleagle textbook cover different sides of these controversies or problems. For example, on the question of the evolution of hominins from Miocene ape precursors, students are asked during the discussion to meet in groups to choose a Miocene ape species and defend it as a potential ancestor. To do so, they must present accurate evidence and logical arguments relating to this problem. This discussion assignment often prompts animated but collegial debate between those who believe Bigfoot is an extant remnant (i.e., living fossil) of a Miocene radiation that has long gone extinct.</p>
<p>ELO 4.1 Describe how the universe, physical systems, life on earth, humanity, or human culture have evolved over time.</p>	<p>This is one of the core elements of the course: to gain an understanding of the major adaptive milestones in primate evolution over the past 65 million years. Students are asked to describe trends in primate evolution along with the selective pressures that led to them. In our five major discussions, on exams, and during the Primate Evolution Symposium, students must first describe the evolutionary changes that are subjects of debates or controversies. Thus, how exactly did Miocene apes evolve and over what period of time, why did their diversity dwindle, how might we understand the origins of our own lineage from the context of ape evolution during the late Miocene? Are there evolutionary remnants of the Miocene hominoid radiation (e.g., Sasquatch!) or are living, 7 foot tall habitually bipedal apes simply an element of our imagination?</p>
<p>ELO 4.2 Summarize current theories of the origin and evolution of the universe, physical systems, life on earth, humanity, or human culture.</p>	<p>Students are asked to summarize and evaluate theories at various points throughout the term. For example, after our in-class discussion on the origins of anthropoids, students are asked on an exam to summarize and evaluate some of the leading current explanations. Students are asked to suggest how they</p>

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	could use evidence from the fossil record or information from living primates to differentiate among these possibilities.
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