ANT 351E (Unique # 31750)
PRIMATE EVOLUTION SPRING 2019
TTH 11:00-12:30 SAC 5.172

Course website on Canvas: http://canvas.utexas.edu/

Primate Evolution fossil database website: http://www.laits.utexas.edu/shapiro/
username: shapiro
password: pr1mate (yes that's a 1, not an i)

Instructor: Liza Shapiro
Office Hours:
Tues (12:30-1:30 p.m.), **Wed** (10:00-11:00 a.m.) or by appointment
471-7533
liza.shapiro@austin.utexas.edu
If you can't come to my office during office hours, please feel free to make an appointment! You are also welcome to communicate with me by email or through Canvas.

Prerequisites: ANT 301
(You will be best prepared for this course if you have had ANT 301, ANT 432L, or ANT 348-Human Evolution).

Course description:

This course is an in depth examination of the fossil record for nonhuman primate evolution. After a basic grounding in the anatomy, ecology, and systematics (evolutionary relationships) of living primates, we will explore each of the major radiations of fossil primates with respect to adaptive diversity, functional morphology, and systematics. This course will help you understand how the evolutionary process has resulted in a wide diversity of living as well as extinct primates. Although we will not cover human evolution specifically, this course will give you the perspective you need to understand the place of humans in primate evolutionary history.

Course objectives: After taking the course, you should understand:

1) the systematics of living primates including the basic anatomical differences that distinguish them functionally and phylogenetically.

2) current methodologies for reconstructing phylogenetic relationships among primates

3) how the study of functional morphology in living primates can be applied to the reconstruction of behavior in fossil primates.

4) the adaptations and phylogenetic relationships among fossil primates, and the relationships of fossil primates to living primates.

Textbooks/Readings/Websites:

Required Textbook:

Fleagle, J. (2013) Primate Adaptation and Evolution 3rd Ed. Academic Press. Available at the University Co-op.

Optional but highly recommended textbook: (a useful reference for comparative primate skeletal anatomy; this atlas will facilitate your lab observations and assignments).

Whitehead P, Sacco W, and Hochgraf S (2005) A Photographic Atlas for Physical Anthropology. Morton Publishing Company. Available at the University Co-op.

Both books are on reserve in the Life Sciences Library if you prefer not to purchase them.

Other Required Readings:

On CANVAS:
In addition to the textbook readings, there will be supplementary readings available in pdf format (or links to webpages) on the course website via Canvas (**http://canvas.utexas.edu/**).

PRIMATE EVOLUTION WEBSITE : http://www.laits.utexas.edu/shapiro/. To log on, use username: shapiro, Password: pr1mate. This website has been developed by me, UT Anthro graduate students, and the College of Liberal Arts. You can use this website as a backup to other assigned course readings. You will also be given specific assigned readings from it.

NOTE: The Primate Evolution Website is a work in progress. I would appreciate feedback on any bugs you find. Reasonably significant feedback can earn you extra credit in the class.

Course requirements:

Lab assignments: You will complete one online lab and four in-class labs using fossil cast material.

Online lab (Primate Form and Function): Available on Canvas. **Due Jan 31 at 11:00 a.m**.

In-class labs:There are four lab assignment sheets available for download from Canvas. Labs will be held during regular class hours (see syllabus). You are required to bring your lab assignment with you to class on lab days (along with your class notes and textbooks). You will hand in your lab answer sheet before you leave class.

Exams: There will be 3 exams; the third exam is given on the last class day and is not cumulative. Each exam will consist of a variety of types of questions, such as multiple choice, short answers, and essays.

Paper: Each student will be required to write a 5-8 page paper, double spaced, 12 pt. font, 1 inch margins. The focus of the paper will be to compare primary (journal articles) and secondary (science reports from the popular press) sources on the same topic within primate evolution**. Further information on the term paper can be found on Canvas.**

- No later than **April 2**, you are required to submit your paper topic to me – at a minimum, you should list your primary source and at least one of your secondary sources. This way, I can let you know if you're on the right track before it's too late. Please come for help in advance of **April 2** if you're having trouble!

- The paper is due **May 7** at 11:00 a.m. (see submission instructions on Canvas)

In conjunction with the paper, you are required to read a tutorial on plagiarism and take a short test on it. The tutorial can be found at
https://legacy.lib.utexas.edu/services/instruction/learningmodules/plagiarism/
The plagiarism test is available on Canvas, and should be completed no later than May 7.
Your term paper will not be graded unless you complete the plagiarism test.

Manage your time wisely when preparing to write the paper. This may help (even though you're not "dummies"!): http://www.dummies.com/how-to/content/budgeting-your-time-to-complete-a-research-paper.html

Grading

Exam 1	20%	
Exam 2	20%	
Exam 3	20%	
Paper	20%	(including turning in your topic/sources by April 2).
Lab assignments:	20%	

Final course letter grades will be assigned using the +/- grading system. Decimal places of 0.5 or above will be rounded up. (e.g. ≥89.5=90=A-)

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
93-100	**90 to <93**	**87 to <90**	**83 to <87**	**80 to <83**	**77 to <80**	**73 to <77**	**70 to <73**	**67 to <70**	**63 to <67**	**60 to <63**	**<60**

Course policies:

The following policies are not intended to be harsh, but are included to provide clear guidelines on issues that students often face throughout the semester.

Expectations:
I expect you to do the assigned readings in advance of the lectures and to come to class each day on time. If we have an in-class lab that day, I expect you to come prepared with your assignment sheet in hand (from Canvas). I will not provide copies of the assignment sheet. If you forget to bring it, you will have to leave class and print it out on campus, which means you will lose precious lab time. *I do not take formal attendance, but I am aware of who consistently comes to class and who doesn't.* Consistent attendance can help boost your grade if you end up with a borderline final grade. Whether you come to class or not, you are responsible for keeping up with what happens in class. This applies to the content of the class, handouts, and announcements about class policies, events, deadlines, etc. Lectures and announcements can be found on Canvas, but it is easy to miss other pertinent information if you are absent from class.

Guns.
As of August 1, 2016, due to the passage of S.B. 11 (https://campuscarry.utexas.edu), licensed, concealed handguns are now allowed in most campus buildings, including classrooms. If you hold a license to carry a concealed weapon, it is your responsibility to know and follow the Texas and University policies listed here: https://campuscarry.utexas.edu/students. Visible weapons or threatening behavior will be reported to the UT Police Department immediately.

The following statement serves as a reminder - I am required to notify you of this *verbally*, and I will do so in class:
Based on my legal right to ban guns from my UT office, ***no guns are allowed in my office* (SAC 5.128)**. Leaving a gun unattended (as it would be, if left outside my office) is against the law. Please plan accordingly. ***YOU*** are always welcome in my office, just not your gun. Thank you.

Make-ups
There will be no make-up exams or in-class labs. Exceptions will be made only 1) with *proof* of dire emergency or illness, 2) due to observance of a religious holy day, or 3) due to military service.

Note: The 3rd exam is scheduled for the last week of classes. If you have other exams scheduled that week, plan to budget your study time well. This happens often, so I cannot give special consideration to students in this situation. I will also not provide alternative exam times for students who have personal travel plans or commitments, so please don't ask.

Illness or emergency: If you miss an exam or lab due to illness or emergency, contact me *as soon as possible* either before the exam or within 2 days after the exam or lab. You will not be given a make-up unless you can provide documentation regarding the reason for your absence.

Religious holy days. —By UT Austin policy, you must notify me of your pending absence at least fourteen days prior to the date of observance of a religious holy day. If you must miss a class, an examination, a work assignment, or a project in order to observe a religious holy day, you will be given an opportunity to complete the missed work within a reasonable time after the absence.

Absence for military service. In accordance with section 51.9111 of the Texas Education Code, a student is excused from attending classes or engaging in other required activities, including exams, if he or she is called to active military service of a reasonably brief duration. [The maximum time for which the student may be excused has been defined by the Texas Higher Education Coordinating Board as "no more than 25 percent of the total number of class meetings or the contact hour equivalent (not including the final examination period) for the specific course or courses in which the student is currently enrolled at the beginning of the period of active military service."] The student will be allowed a reasonable time after the absence to complete assignments and take exams.

Students with disabilities: Students with disabilities may request appropriate academic accommodations from the Division of Diversity and Community Engagement, Services for Students with Disabilities at 512-471-6259 (voice) or 512-410-6644 (video phone) or ssd@austin.utexas.edu or http://ddce.utexas.edu/disability/. ***Please inform me as soon as possible if you need accommodations.***

Late assignments

Late term papers or labs will cost you 10 points (out of 100) per day. This could change your grade dramatically. Don't be late!

Grades

The grade you are given, either on an individual exam or assignment or as your final grade, is not the starting point of a negotiation. It is your grade unless an error has been made. If you think an error has been made, let me know within one week of receiving the assignment or exam grade.

** **Important**! I do not offer "extra credit" opportunities, but I am happy to help you find ways to improve your grade. If you are struggling in the course, please come for help *during* the semester when there is still time for me to help you. Take advantage of my office hours or make an appointment with me. Do not wait until the course is almost over to discuss your grade with

me. By then, it is too late for me to help you.

Honor Code: Each student in this course is expected to abide by the University of Texas Honor Code.:
The core values of The University of Texas at Austin are learning, discovery, freedom, leadership, individual opportunity, and responsibility. Each member of the university is expected to uphold these values through integrity, honesty, trust, fairness, and respect toward peers and community.

Scholastic Dishonesty
Students who violate University rules on scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and/or dismissal from The University. Scholastic dishonesty" includes, but is not limited to, cheating, plagiarism, collusion, falsifying academic records, misrepresenting facts, and any act designed to give unfair academic advantage to the student (such as, but not limited to, submission of essentially the same written assignment for two courses without the prior permission of the instructor), or the attempt to commit such an act.

See http://deanofstudents.utexas.edu/sjs/scholdis.php and
http://deanofstudents.utexas.edu/conduct/standardsofconduct.php

For a tutorial and information on plagiarism, see
https://legacy.lib.utexas.edu/services/instruction/learningmodules/plagiarism/

Emergency evacuation: (Office of Campus Safety and Security, 512-471-5767, http://www.utexas.edu/safety/)

- Occupants of buildings on The University of Texas at Austin campus are required to evacuate buildings when a fire alarm is activated. Alarm activation or announcement requires exiting and assembling outside.

- Familiarize yourself with all exit doors of each classroom and building you may occupy. Remember that the nearest exit door may not be the one you used when entering the building.

- Students requiring assistance in evacuation shall inform their instructor in writing during the first week of class.

- In the event of an evacuation, follow the instruction of faculty or class instructors.

- Do not re-enter a building unless given instructions by the following: Austin Fire Department, The University of Texas at Austin Police Department, or Fire Prevention Services office.

Other useful information:

Resources for Learning & Life at UT Austin

- The University of Texas has numerous resources for students to provide assistance and support for your learning.
    - Sanger Learning and Career Center: **https://ugs.utexas.edu/slc**
    - Undergraduate Writing Center: **http://uwc.utexas.edu/**
    - Counseling & Mental Health Center: **http://cmhc.utexas.edu/**
    - Career Counseling: **http://ugs.utexas.edu/vick/career**
    - Student Emergency Services: **http://deanofstudents.utexas.edu/emergency/**

Behavior Concerns Advice Line (BCAL)

- If you are worried about someone who is acting differently, you may use the Behavior Concerns Advice Line to discuss by phone your concerns about another individual's behavior. This service is provided through a partnership among the Office of the Dean of Students, the Counseling and Mental Health Center (CMHC), the Employee Assistance Program (EAP), and The University of Texas Police Department (UTPD). Call 512-232-5050 or visit **http://www.utexas.edu/safety/bcal**

ANT 351E (31750) PRIMATE EVOLUTION
SPRING 2019
DR. LIZA SHAPIRO

SCHEDULE: Lectures, labs, exams

JAN	22	INTRODUCTION
	24	Evolution, natural selection and speciation
	29	Cladistics: Reconstructing phylogenetic relationships
	31	What is a primate? **Lab 1 (online, due today): Primate form and function**
Feb	5	Extant primates I: Strepsirrhines
	7	Extant primates II:Haplorhines - Platyrrhines
	12	Extant primates III: Haplorhines - Catarrhines
	14	Primate origins: Hypotheses
	19	**Lab 2 (in class)- Extant primates**
	21	**EXAM 1**
	26	The Paleocene fossil record + Adapoids I: Morphology and adaptations
	28	Adapoids II: Phylogenetic relationships
Mar	5	Omomyoids I: Morphology and adaptations
	7	Omomyoids II: Phylogenetic relationships
	12	Early anthropoids I: Morphology, adaptations of Eocene anthropoids
	14	**Lab 3 (in class): Early primates**
	19	SPRING BREAK
	21	SPRING BREAK
	26	Early anthropoids II: Morphology, adaptations of Oligocene anthropoids
	28	Class will not meet – work on your paper
Apr	2	Early anthropoids III: Phylogenetic relationships **(Submit paper topic today)**
	4	**Lab 4 (in class): Anthropoid origins**
	9	Review for Exam 2
	11	**EXAM 2**
	16	Strepsirrhine evolution
	18	Platyrrhine evolution
	23	Cercopithecoid evolution
	25	Hominoid evolution I:Early Miocene/Adaptations and phylogeny
	30	Hominoid evolution II: Mid-Late Miocene /Adaptations and phylogeny
May	2	**Lab 5 (in class) Miocene primates**
	7	Review for exam 3 and **PAPER DUE TODAY**
	9	**EXAM 3**

ANT 351E PRIMATE EVOLUTION SPRING 2019
DR. LIZA SHAPIRO

READING LIST

TB=Textbook (Fleagle)

CV= Canvas . Readings are available online via Canvas (Go to http://canvas.utexas.edu and link to ANT 351E). You can also connect to Canvas from the Primate Evolution Website (see below).

PEW= Primate Evolution website: Go to http://www.laits.utexas.edu/shapiro (You can also connect to the PEW from Canvas). To log into PEW, use Name: shapiro, Password: pr1mate (note it's a 1 not i).

Jan 22 Introduction: What is this course about?

CV: Alters, B.J. and Alters, S. (2001). Why should students learn evolution? From Defending Evolution in the Classroom, Jones and Bartlett Publishers, Sudbury MA: pp.103-112.

Jan 24 Evolution, natural selection, and speciation

CV: Read pages 29-52 in Cartmill, M., Smith, F.H., Brown, K.B. (2009) The Human Lineage. Chapter 2: Analyzing Evolution.

Optional/helpful:
http://www.nature.com/scitable/knowledge/library/macroevolution-examples-from-the-primate-world-96679683

Jan 29 Cladistics: Reconstructing phylogenetic relationships

TB: Fleagle Ch. 1

CV: Read pages 52-62 in Cartmill, M., Smith, F.H., Brown, K.B. (2009) Chapter 2: Analyzing Evolution.

CV: Martin, R. (1992) Classification and evolutionary relationships. (from: The Cambridge Encyclopedia of Human Evolution, Cambridge University Press pp.17-23).

Optional reading: Useful readings/websites on cladistics

1. Novick, Laura R., Kefyn M. Catley, and Emily G. Schreiber. "Understanding Evolutionary History: An Introduction to Tree Thinking." (2012).
http://www.vanderbilt.edu/peabody/novick/UG%20tree-thinking%20booklet%208-12.pdf

2. http://www.ucmp.berkeley.edu/clad/clad4.html

Jan 31 What is a primate?

(online lab (Lab 1: Primate Form and Function) is due today. Submit through Canvas.

TB: Fleagle: Ch. 2

CV: McGraw,S. (2010) Primates Defined. In: A Companion to Biological Anthropology (2010). Edited by Clark Spencer Larsen. West Sussex, United Kingdom:Wiley-Blackwell..pgs 222-242.

Optional helpful reading:

CV: Kirk, E. C. (2013) Characteristics of Crown Primates. Nature Education Knowledge 4(8):3

http://www.nature.com/scitable/knowledge/library/characteristics-of-crown-primates-105284416

Feb 5 Extant Primates I: Strepsirrhines

TB: Fleagle Chapter 4 (you can skip pp. 73-77 for now)

CV: Martin, R (1990) Are the Malagasy lemurs monophyletic? (pp. 670-676 in Primate Origins and Evolution: A phylogenetic reconstruction. Princeton University Press).

Feb 7 Extant Primates II : Haplorhines - Platyrrhines

TB: Fleagle Ch. 5

CV: Ford, S (1980) Callitrichids as phyletic dwarfs, and the place of the Callitrichidae in Platyrrhini. Primates, Vol. 21:31-43.

Optional additional reading: (and look over Figure 7)
CV: Soligo, C. and Müller A. (1999) Nails and claws in primate evolution. J. Hum. Evol. 36:97-114.

Feb 12 Extant Primates III: Haplorhines - Catarrhines

TB: Fleagle Chs 6 and 7

CV: Collard, M. and Aiello, L. (2000). From forelimbs to two legs. Nature 404:339-340

Optional:

CV: Langdon, J. H. (2016). Case Study 6. Quantifying Evolution: Morris Goodman and Molecular Phylogeny. In *The Science of Human Evolution* (pp. 43-49). Springer International Publishing

Feb 14 Primate Origins: Hypotheses

TB: Fleagle pp. 224-225

CV: Sussman, R. W., Tab Rasmussen, D., & Raven, P. H. (2012). Rethinking Primate Origins Again. *American Journal of Primatology*. 75:95-106.

Optional additional reading:

CV: Cartmill, M (1992) New views on primate origins. Evolutionary Anthropology 105-111

Feb 19 Lab 2 (in class) - Extant Primates
BRING YOUR LAB ASSIGNMENT TO CLASS (available online in CV)

Feb 21 EXAM 1

Feb 26: The Paleocene fossil record + Adapoids I: Morphology and adaptations

TB: Fleagle Chs. 10, 11

TB: Fleagle pp. 229-247

Look over:

CV: Franzen JL, Gingerich PD, Habersetzer J, Hurum JH, von Koenigswald W, et al. 2009 Complete Primate Skeleton from the Middle Eocene of Messel in Germany: Morphology and Paleobiology. PLoS ONE 4(5): e5723. http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0005723

PEW: From fossil database page, click on and read:

Paleocene http://www.laits.utexas.edu/shapiro/pc/pc.html
Eocene http://www.laits.utexas.edu/shapiro/pc/pc01.html
Adapoids http://www.laits.utexas.edu/shapiro/adapoid/index.html

Optional: Plesiadapiformes http://www.laits.utexas.edu/shapiro/plesi.html

Feb 28 : Adapoids II: Phylogenetic relationships

CV: Switek BJ. Ancestor or adapiform? *Darwinius* and the search for our early primate ancestors. Evol Educ Outreach. 2010;3:468–76.

Optional (similar to Switek article):
CV: Fleagle, J.G. 2010 The Many Worlds of Ida. Perspectives in Biology and Medicine, Volume 53, Number 4, Autumn 2010, pp. 605-612 (Review)

March 5: Omomyoids I: Morphology and adaptations

TB: Fleagle pp.247-260

CV: Martin, Robert D. Chinese lantern for early primates *Nature* 427.6969 (2004): 22-23.

PEW: From fossil database page, click on and read:
Omomyoids (http://www.laits.utexas.edu/shapiro/omomyids/omomyids.html

Mar 7: Omomyids II: Phylogenetic relationships
See Feb 27.

Mar 12: Early anthropoids I: Morphology, adaptations of Eocene anthropoids

Fleagle: pages 265-284 (covers Eocene and Oligocene fossil anthropoids)

PEW: Section on Early Anthropoids

Mar 14 Lab 3 (in class) : Early primates

BRING YOUR LAB ASSIGNMENT SHEET TO CLASS (available online on CV)

March 19 and March 21: SPRING BREAK

Mar 26 Early anthropoids II: Morphology, adaptations of Oligocene anthropoids

TB: Fleagle 311-313

CV: Fossil skull fingered as ape–monkey ancestor : Nature News

http://www.nature.com/news/2010/100714/full/news.2010.354.html

PEW: section on Early Catarrhines: Propliopithecidae
(Reminder: due April 2: your paper topic and list of sources.)

Mar 28: Work on your paper

Apr 2: Early anthropoids III: Phylogenetic relationships (and paper topic due today)

UPLOAD YOUR PAPER TOPIC TO CANVAS BY 11 A.M. TODAY

TB: Fleagle pp. 284-286

CV: Williams, B. A., Kay, R. F., Kirk, E. C., & Ross C. F. (2010) *Darwinius masillae* is a strepsirrhine – a reply to Franzen et al. (2009). *Journal of Human Evolution*. 59: 567-573.

Apr 4: Lab 4 (in-class) : Early anthropoids

BRING YOUR LAB ASSIGNMENT SHEET TO CLASS (available online on CV)

Apr 9: In class review for Exam 2 – come to class prepared with questions

Apr 11 : EXAM 2

Apr 16: Strepsirrhine evolution

TB: Fleagle ; pages 73-77, 244-246

CV: Martin, R. (2003). Combing the primate record. Nature 422: 388-390. Martin_03.pdf

CV: Krause, D. W. (2010). Washed up in Madagascar. *Nature*, *463*(7281), 613-614.

PEW: Section on Subfossil lemurs

Apr 18: Platyrrhine evolution

TB: Fleagle Ch. 14

PEW Section on Platyrrhine Evolution

Apr 23: Cercopithecoid evolution

TB: Fleagle Ch. 16

CV: Köhler, M; Moyà-Solà, S. Fossil muzzles and other puzzles. Nature, 388:327 .

PEW: Section on Cercopithecoidea http://www.laits.utexas.edu/shapiro/catars/catar08.html

optional/recommended: Gonzales, L. A., Benefit, B. R., McCrossin, M. L., & Spoor, F. (2015). Cerebral complexity preceded enlarged brain size and reduced olfactory bulbs in Old World monkeys. *Nature communications*, *6*, 7580.

Apr 25 –Hominoid evolution I: Early Miocene/Adaptations and phylogeny

TB: Fleagle pages 313-333

CV: Read pages 74-78 of Begun, D. (2003) Planet of the apes. Scientific American. 289:74-83

PEW: Hominoid Evolution: Sections on Hominoidea, Proconsulidae, and Incertae Sedis http://www.laits.utexas.edu/shapiro/homin/homin.html

Apr 30: Hominoid evolution II: Mid-Late Miocene: Adaptations and phylogeny

TB: Fleagle, pages 333-339

CV: Read pages 78-83 of Begun, D. (2003) Planet of the apes. Scientific American. 289:74-83

CV: Andrews, Peter & David Pilbeam (1996) The nature of the evidence. Nature, 379: 123-124.

May 2: Lab 5 (in-class): Miocene primates

BRING YOUR LAB ASSIGNMENT SHEET TO CLASS (available online on CV)

May 7: In-class review for Exam 3 (come prepared with questions) and **term paper due today!**

May 9: EXAM 3