**EVOLUTION OF PRIMATE LIFE HISTORIES (ANTH 3409.80, CRN 87598)**
SYLLABUS, FALL 2017

MW, 12:45-2:00 pm
1957 E Street, Room 316

**INSTRUCTOR:** Shannon C. McFarlin, Ph.D.
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**Office Hours**: Wednesdays 2:30-4:30pm, or by appointment

**COURSE DESCRIPTION:**
Why do humans take so long to grow up, and have such long post-reproductive lifespans? Is human childhood unique among our closest living relatives? How can we understand the extraordinary diversity among nonhuman primates in their ages at weaning, interbirth intervals, and patterns of body size growth? What does the fossil record tell us about when and how the unique life history strategies of humans, and other primates, evolved?

These are some of the questions we will address in this course. The study of life history seeks to understand variation in how organisms invest energy in growth, reproduction and survival over the course of their lifetimes. Primates and other organisms display a tremendous diversity in their life history strategies. Some live relatively short lives and reproduce frequently or in large numbers; others reproduce less often and spread this reproduction out over a longer lifespan; and some combine these traits in still other ways. Why do organisms differ in such traits as age at weaning, age at first birth, offspring size, growth rates, fertility, and life span? How, if at all, do primate life histories vary with body size, brain size, local ecology, and social behavior? How do modern humans fit into this diversity? Life history theory seeks to explain diversity in these major transitions that characterize an organism's life cycle from conception to death, and understand the consequences of life history variation for evolutionary fitness.

This course surveys recent developments in the study of human and non-human primate life histories and their evolution. We will first discuss the foundations of life history research and theory, focusing on describing and explaining patterns of life history variation observed among species. We will then take a life cycle approach, starting with conception and ending with aging, to study in more detail the specific features of organismal life histories. With each major topic, we will incorporate comparisons of life history traits among living primate groups, as well as evidence of variation within species, to understand life history patterns as the integrated result of physiology and socioecology. This approach will allow us to consider the causes and consequences of individual differences in life history within populations, and discuss how selective pressures may have shaped primate life history patterns over evolutionary timescales. We will end the course with a discussion of features of modern human life histories – such as our unique pattern of childhood growth, late age at maturity, and long post-reproductive life spans. We will discuss explanations for the origins of modern human life history, and consider the fossil evidence for when this unique pattern may have evolved.

**Prerequisites**: Students in this course will benefit from having had a prior introductory course in biological anthropology (ANTH 1001) or other equivalent course, which provides a foundational understanding of evolution by natural selection, primate diversity, and human evolution. If you have not had prior introductory coursework in these topics, please come see me.

**LEARNING OBJECTIVES:** At the end of this course, students will be able to:

(1) Explain theoretical and conceptual foundations for the study of primate life history evolution, as well as relationships between life history attributes, growth and development, and socioecology;
(2) Apply evolutionary theory to understand diversity in primate life histories;
(3) Explain the unique features of modern human life history, examples of how modern human life histories vary, and the basic empirical evidence for human life history evolution;
(4) Present, discuss and critically evaluate theoretical arguments and empirical evidence in the primary scientific literature on topics relevant to life history evolution, and consider how these findings are interpreted and communicated by the media to the public;
(5) Synthesize and use knowledge gained in this course to identify and explore an unanswered research question of relevance to primate life history evolution, critically evaluate the empirical evidence and theoretical arguments surrounding this question, and design a research program to address this problem, in the form of a mock grant proposal and class presentation.

**READINGS:**

There is no single introductory-level text available that covers the variety of topics in primate life history evolution to be discussed in this course. Therefore, each week we will read a selection of book chapters and peer-reviewed journal articles from the primary scientific literature to supplement our discussions of class topics. Reading assignments will be uploaded to Blackboard one week in advance of each lecture.

**Other sources:** The following includes a list of edited volumes covering issues in life history evolution, from which occasional chapters will be drawn for our weekly readings. These are not required texts, but are listed here for your interest and as possible sources for your grant proposals (explained below).


Clancy K.B.H., Hinde K., Rutherford J.N., Eds. (2013) *Building Babies: Primate Development in Proximate and Ultimate Perspective.* Developments in Primatology: Progress and Prospects, Vol. 37. New York: Spring Science+Business Media.

Ellison P.T. (2001) *Reproductive Ecology and Human Evolution.* New York: Walter de Gruyter.

Hawkes K. & Paine R.R., Eds. (2006) *The Evolution of Human Life History.* Santa Fe: School of American Research Press.

Kappeler P.M. & Pereira M.E., Eds. (2003) *Primate Life Histories and Socioecology*. Chicago: University of Chicago Press.

Pereira M.E. & Fairbanks L.A. (1993) *Juvenile Primates: Life History, Development, and Behavior.* Chicago: University of Chicago Press.

**COURSE REQUIREMENTS FOR ANTH 3409:**

Your final course grade will be based on the following work, and calculated out of a total of 100 possible points.

| | |
|---|---|
| 40 points | Two exams, worth 20 points each |
| 10 points | News Update |
| 10 points | Attendance and Participation in Class Discussions |
| 30 points | Research Grant Proposal |
| 10 points | Research Proposal Presentation |

(1) EXAMS: Two exams will be administered during this course, based on lectures, readings, and class discussions. The format of these exams may include multiple choice and/or matching, fill-in-the-black, short answer and essay questions. The final exam will not be explicitly cumulative, though it may require you to draw upon and build on foundational knowledge acquired during the first half of the course.

(2) NEWS UPDATE: Every week, there is something new in the media about human or nonhuman primate life history, social behavior and ecology, growth and development, and/or evolution, and it is both important and interesting to keep up with these findings and provide a venue to briefly discuss them in class. This also presents an opportunity to consider how science is interpreted by the media, and through the media then communicated to the general public.

At the beginning of class each **Monday**, two students (working as a pair) will present a 10-minute update on a recent research finding (of relevance to the above topics) reported in the news. A sign up sheet for news updates will be distributed during the second week of class; each student will do this once during the semester, working with a partner.

Requirements for the presentation:

a) Choose one news item from the past 6 months to present.
b) In addition, search out the *primary literature source* (i.e., the primary scientific journal article that originally reported on the work) and read this as well.
c) Include in your presentation a brief statement of the specific *question* addressed by the research team, the *method* used to address this question, and *conclusions* of the study. Also, briefly summarize the major conclusions and broader significance of the findings *as they were discussed in the primary source and as they were interpreted in the media coverage*.
d) Briefly discuss what you consider to be the importance or broader relevance of the findings to major concepts discussed during this class and/or human evolutionary studies more generally.
e) Remember that your audience may include non-experts, and you want to engage us in excitement about this recent finding! To the extent that these are relevant, you are encouraged to think creatively about how to incorporate other multi-media links, PowerPoint content, suggested readings or other material to do this.

**No later than 5pm on Friday of the preceding week**, email me the following:

a) A link to the news article.

b) A link/PDF of the primary literature source.
c) Any additional multi-medial links, reading or other content to be circulated to the class, of relevance to the news update.

(3) PARTICIPATION IN CLASS DISCUSSIONS – Weekly Journal Club. While the format of this course will include weekly lectures, a substantial portion of this class will be run as a discussion seminar and working in small groups. Our purpose is to read primary literature on topics in primate life history evolution together as a class, both to understand the issues and practice our critical thinking skills. *Everyone is expected to complete the readings in advance, and come to class prepared to contribute to class discussion*.

In addition to more informal class discussions that may arise during lecture, journal articles from the primary scientific literature will be chosen each week for a 'Journal Club', most typically held on **Wednesdays**. Weekly Journal Clubs will involve discussion of the article in small groups, with an emphasis on critically evaluating the merits and shortcomings of the methods, findings, and interpretation presented in the paper, and discussing its relevance to broader theoretical issues. For each journal club, you will be asked to either respond to or generate questions within your small group, and hand in these written responses at the end of the class period. For some topics, students may be tasked with representing alternate arguments/theoretical frameworks to be debated. If I see that students are not participating in discussions, I reserve the right to assign discussion leaders each week.

Given the structure of this course, we expect to hold 8 Journal Clubs during the course of the semester, although this is subject to change. Weekly attendance and participation in both informal discussions and journal clubs are worth a possible total of **10 points** to be earned by the end of the semester.

(4) MOCK RESEARCH GRANT PROPOSAL: Using knowledge gained during the course and from your own independent reading of the literature, identify an outstanding research question of significance for the study of life history evolution, and develop a hypothesis-driven project designed to address it. This is to be written in the form of a grant proposal, structured in accordance with guidelines of one of our field's funding key agencies: The Leakey Foundation (https://leakeyfoundation.org/wp-content/uploads/2015/11/Leakey-Application-Instructions-1.pdf). A detailed rubric will be posted to blackboard. We will also devote class time to peer 'workshopping' of your research ideas over the course of the semester.

(5) RESEARCH PROPOSAL PRESENTATION: During the last two meetings of class, each student will give a brief oral presentation (using Power Point) of her/his research proposal topic. A grading rubric for this presentation will be posted to blackboard.

## OTHER POLICIES AND RESOURCES:

### Time & Effort

This is a 3 credit hour class. In addition to the 2.5 hours per week of direct interaction in class, it is anticipated that you will spend a minimum of 5 hours per week on independent learning outside of class (i.e., readings and other assignments), totaling 7.5 hours per week (on average over a 15-week semester). More information about GW's credit hour policy can be found at https://provost.gwu.edu/files/downloads/Resources/Assignment-Credit-Hours-7-2016.pdf

### Attendance

The format of this course will include lectures, discussions as a class and in small groups, and lab visits for an introduction to research methods used in the study of primate life history evolution. Attendance is critical. Material from lectures, discussions, readings and lab visits will be tested on the exams. Further, knowledge will be cumulative, and we will reference previous topics in our weekly lectures and discussions. Classes should not be missed except for reasons beyond your control and for which you can provide documentation, such as illness, family emergencies, or participating in university-sanctioned activities. ***More than one unexcused absence in the semester will result in lowering of your Participation grade by 1 point for every missed class.***

### Late Work / Missed Exams and Presentations

Late assignments and make up exams or presentations will **only** be granted in very limited circumstances, which include an emergency in your immediate family or a medical illness for which you can provide documentation. In such cases, you are required to notify me **prior** to class.

### Religious Holidays

It is completely acceptable for you to miss class due to observance of religious holidays. However, it is your responsibility to look ahead on the calendar and notify me of any conflicts (for the entire semester) no later than the **second week of class (by September 6th)**.

### Blackboard

Once you are registered for this course, you will automatically have access to the Blackboard site associated with it. Go to https://blackboard.gwu.edu/ and sign in using your email ID and password. We will use Blackboard to communicate announcements, provide weekly reading assignments, store important documents and external links to web sites of interest that deal with material covered in the course, and provide a way for you to check your grades as the course progresses.

### Academic Integrity

All graded work must be completed in accordance with The George Washington University Code of Academic Integrity, which states: "Academic dishonesty is defined as cheating of any kind, including misrepresenting one's own work, taking credit for the work of others without crediting them and without appropriate authorization, and the fabrication of information." GW's Code of Academic Integrity is available online: http://www.gwu.edu/~ntegrity/code.html

### Support for Students Outside of the Classroom

Disability Support Services (DSS). Any student who may need an accommodation based on the potential impact of a disability should contact the Disability Support Services office at 202-994-8250 in the Marvin Center, Suite 242, to establish eligibility and to coordinate reasonable accommodations. For additional information, please refer to http://gwired.gwu.edu/dss/

University Counseling Center (UCC). The Counseling Center (UCC) offers 24/7 assistance and referral to address students' personal, social, career, and study skills problems. Services for students include: crisis and emergency mental health consultations; and confidential assessment, counseling services (individual and small group), and referrals. You can reach the UCC at 202-994-5300. For additional information, please refer to http://gwired.gwu.edu/counsel/CounselingServices/AcademicSupportServices

GW Haven and Title IX. You are entitled to an educational environment free from gender-based discrimination, sexual harassment and assault. The university works in a variety of ways to eliminate misconduct, including sexual harassment and assault, in the community and support members of our community who experience or witness it. Please refer to GW's Haven website for more information about Title IX and other resources, support, and reporting mechanisms: https://haven.gwu.edu/

**Security**

In the case of emergency, if at all possible, the class should shelter in place. If the building that the class is in is affected, follow the evacuation procedures for the building. After the evacuation, seek shelter at a predetermined rendezvous location.

**SCHEDULE OF TOPICS**

The schedule of topics is provided below. This is **subject to change** as we move through the course, and as may be needed to take advantage of new literature, class interests and allow for class discussion. Any changes to this schedule will be announced in class, and an updated syllabus posted to blackboard as changes arise. It is your responsibility to check the schedule on blackboard frequently.

| WEEK | DATES | TOPIC |
|---|---|---|
| 1 | 28-Aug<br>30-Aug | Organization of the course<br>Fundamentals: Primer on Socioecology |
| 2 | 4-Sep<br>6-Sep | *NO CLASS: Labor Day*<br>Defining life histories: basic concepts and life history variables |
| 3 | 11-Sep<br>13-Sep | Fundamentals of life history theory |
| 4 | 18-Sep<br>20-Sep | Size and growth |
| 5 | 25-Sep<br>27-Sep | Reproduction; from pre- to post-natal life |
| 6 | 2-Oct<br>4-Oct | Infancy, lactation and weaning<br>*Visit to Laboratory for Evolutionary Neuroanatomy* |
| 7 | 9-Oct<br>11-Oct | *NO CLASS: Fall Break*<br>Infancy, lactation and weaning (continued) |
| 8 | 16-Oct<br>18-Oct | Juvenile period<br>Reproductive lifespan and aging |
| 9 | 23-Oct<br>25-Oct | **EXAM 1**<br>Brain and Life History; **Grant proposal topic due** |
| 10 | 30-Oct<br>1-Nov | Morphology and life history<br>*Visit to Hard Tissue Research Laboratory* |
| 11 | 6-Nov<br>8-Nov | Features of modern human life history |
| 12 | 13-Nov<br>15-Nov | Variation in modern human life history - reproductive ecology and growth |
| 13 | 20-Nov<br>22-Nov | Variation in modern human life history - early adversity<br>*NO CLASS: Thanksgiving Break* |
| 14 | 27-Nov<br>29-Nov | The fossil evidence - human life history in evolutionary perspective |
| 15 | 4-Dec<br>6-Dec | **EXAM 2**<br>**STUDENT PRESENTATIONS** |
| 16 | 11-Dec | **STUDENT PRESENTATIONS** |
| | | **GRANT PROPOSAL DUE on GW scheduled final exam date, TBD** |