



*Photographically reduced from Diagrams of the natural size (except that of the Gibbon, which was twice as large as nature), drawn by Mr. Waterhouse Hawkins from specimens in the Museum of the Royal College of Surgeons.*

## **HOMININ EVOLUTION (ANTH3412)**

**Fall 2018**

**M, W: 3:45- 5 PM**

**Lecture meets in Tompkins Hall of Engineering, Room 302**

**Lab sections meet in Lisner Hall, Room 130**

**Course Instructor:** Dr. Laurence Dumouchel

**Office Hours:** Tuesday, 3:00-5:00 PM or by appointment

**Contact:** [ldumouchel@gwu.edu](mailto:ldumouchel@gwu.edu)

**Office Location:** Science & Engineering Hall, 6<sup>th</sup> floor, #6675

This course requires attendance at joint lecture and lab sections. Lab sections will cover new material, and expand on topics introduced in lecture. The assigned readings also explain many topics in greater detail than is possible during lecture.

### **LAB SECTIONS**

TA: Victoria Lockwood ([vlockwood@gwu.edu](mailto:vlockwood@gwu.edu))

Office Hours: TBD

Office Location: SEH, 6<sup>th</sup> Floor

| Section | Time                |
|---------|---------------------|
| 30      | M 5:10 pm - 7:00 pm |
| 31      | M 7:10 pm - 9:00 pm |

### **COURSE DESCRIPTION**

The study of human evolution involves: understanding the evolutionary context and the circumstances surrounding the origin of the clade (group) that includes modern humans and their closest fossil relatives, identifying species in the fossil record that belong in that clade, reconstructing the morphology and behavior of those species, determining how they are related to each other and to modern humans, investigating the factors and influences (e.g., genetic, environmental) that shaped their evolution, and reconstructing the origins of modern human anatomy and behavior. This course concentrates on the fossil and to a lesser extent the molecular evidence, but it will refer to the archeological record when the latter can provide insights into hominin behavior.

## **LEARNING OBJECTIVES (Specific)**

By the end of this semester, students will learn to:

- Understand the scope of hominin paleobiology
- Be able to identify the important research questions within hominin paleobiology
- Become familiar with the classes of evidence available to hominin paleobiologists
- Know the main analytical and research methods used in hominin paleobiology
- Be familiar with the hominin fossil record and, as appropriate, its context (e.g., its geological age, paleoenvironmental context, etc.)
- Be sufficiently familiar with the anatomy of modern humans and with anatomical terminology so to be able to understand and comprehend simple descriptions of hominin fossils

## **LEARNING OBJECTIVES (General)**

By the end of this semester, students will develop skills allowing them to:

- Be able to analyze evidence critically (evaluate strengths and weaknesses)
- Understand the limitations and inherent uncertainties of a historical science such as hominin paleobiology
- Be able to discriminate between evidence and the interpretations placed on that evidence
- Be sufficiently familiar with the paleontological evidence and the relevant research methods follow the arguments set out in reviews of the primary research literature
- Be aware of the strengths and limitations of the main quantitative methods used in hominin paleobiology research

## **REQUIRED MATERIALS**

- (1) Specific reading assignments will be posted on Blackboard each week, following the course schedule (subject to change)
- (2) Lab manual: provided

## **EVALUATION**

Two exams are scheduled for this course, each counting for 15% of the final grade (total = 30%). Two projects will be assigned, each counting for 15% of the final grade (total =30%). The remaining 40% (11 labs, 3% each + 1 anatomy quiz, 7%) of the final grade is based on attendance and participation in the labs, including completion of laboratory exercises. The laboratory grade is calculated on the basis of the total number of points earned for each lab, as a percentage of the total number of possible points. All labs are worth the same number of points.

- Exam 1: 15%
- Exam 2: 15%
- 11 labs, 3% each: 33%
- Anatomy Quiz: 7%
- Creative Study Guide: 15%
- Evolutionary trends presentations: 15%

## GRADING SCHEME

Letter grades are assigned at the end of the semester using the +/- system according to the following chart. **Final grades are not rounded, and there is no extra credit offered.**

|    |            |    |            |
|----|------------|----|------------|
| A  | 93%-100%   | C  | 73%-76.99% |
| A- | 90%-92.99% | C- | 70%-72.99% |
| B+ | 87%-89.99% | D+ | 67%-69.99% |
| B  | 83%-86.99% | D  | 63%-66.99% |
| B- | 80%-82.99% | D- | 60%-62.99% |
| C+ | 77%-79.99% | F  | 0%-59.99%  |

## 'EVOLUTIONARY TRENDS' PRESENTATIONS

With these presentations, students will have the opportunity to reflect on how several key traits changed through the human lineage. Each presentation will focus on (1) a theme that can be observed in the fossil record and (2) a body part or fossil evidence. The instructor will lead a class on trends around diet and teeth as an example. Students will work in teams of 2 or 3 and present on one of the follow themes:

- Locomotion and the lower limb
- Manual dexterity and the upper limb
- Cognition and language and the brain
- Obstetrics and the pelvis
- A different theme, upon approval from the instructor

## MAKE-UP EXAMS

The dates for the exams are posted on the course schedule below. Make travel plans accordingly. Make-up exams may be scheduled in two circumstances, as follows. (1) If you must miss an exam due to an unavoidable conflict, such as observance of a religious holiday or participation in a school-sanctioned sport, you must notify your teaching assistant **at least one month prior** to the exam date. (2) If you must miss an exam for an unforeseen medical reason or emergency, **notify the course instructor as soon as possible**. Documentation of your reason for missing the exam (e.g., a note from student health) may be required. **All make-up exams must be taken within one week of the original exam date**, except in rare circumstances. If the course director is not notified of a student's intention to miss an exam until *after* the exam has already been administered in class, the make-up exam may be given in essay format.

## MISSED LAB SECTIONS.

If you have an unavoidable conflict, you must communicate with your instructor **well ahead of time** (at least one month in advance) in order to arrange an alternate lab section. If you must miss lab due to an unforeseen excused absence, such as illness (including flu-like symptoms) or emergency, **notify the teaching assistant as soon as possible, within 3 days of the missed lab**. Documentation of your reason for missing the lab (e.g., a note from student health) may be required. **For excused absences and if you have notified the teaching assistant as required**, you will be given an opportunity to

make up the missed laboratory content. Otherwise, unexcused absences from lab will result in a zero for that week. We also recommend that you ask a classmate to review their lab notes with them, since the lab material will be included on the exams.

### **RELIGIOUS HOLIDAY**

It is completely acceptable for you to miss lecture or lab due to observance of religious holidays. However, it is your responsibility to look ahead on the calendar and notify the instructor of any conflicts (for the entire semester) with lab or lecture no later than the **first month of class**.

### **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 GW NetID and password. We will use Blackboard to communicate announcements, 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 Student Conduct, available online: <https://studentconduct.gwu.edu/code-student-conduct>

### **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 Rome Hall, Suite 102, to establish eligibility and to coordinate reasonable accommodations. For additional information, please refer to <https://disabilitysupport.gwu.edu/>
- **Mental Health Services.** The Colonial Health Center 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 Colonial Health Center at 202-994- 5300. For additional information, please refer to <https://healthcenter.gwu.edu/mental-health>
- **International Services Office (ISO).** The International Services Office offers free tutoring and language support for international students who are non-native English speakers. For additional information, please refer to <https://libguides.gwu.edu/c.php?g=576191&p=4068674>

### **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.

## COURSE SCHEDULE

| WEEK | DATE      | TOPIC  | Readings                   |
|------|-----------|--|----------------------------|
| 1    | M, Aug 27 | Introduction to the course<br>What is hominin paleobiology?<br><u>Assignment:</u> Creative study guide | Wood, 2014                 |
|      | W, Aug 29 | Taxonomy and Systematics   | Wood, 2010                 |
|      | Lab       | <b>Lab 1: Taxonomy [Take-home, due on week 3 in lab]</b>   |                            |
| 2    | M, Sep 3  | Labor Day (no class)   |                            |
|      | W, Sep 5  | Overview of the fossil record  | Pontzer, 2012              |
|      | Lab       | No lab meeting   |                            |
| 3    | M, Sep 10 | Studying the fossil record: geology  | Peppe, 2013                |
|      | W, Sep 12 | Studying the fossil record: phylogeny  | Baum, 2008                 |
|      | Lab       | <b>Lab 2: Cladistics [Lab 1 due]</b>   |                            |
| 4    | M, Sep 17 | Studying the fossil record: anatomy  | See Blackboard             |
|      | W, Sep 19 | Studying the fossil record: paleoclimate and fauna   | Levin, 2015                |
|      | Lab       | <b>Lab 3: Anatomy</b>  |                            |
| 5    | M, Sep 24 | Evolutionary history of the apes and hominoid origins  | MacLatchy 2015             |
|      | W, Sep 26 | Miocene hominids   | Begun <i>et al.</i> , 2012 |
|      | Lab       | <b>Lab 4: Modern apes<br/>Anatomy Quiz</b>   |                            |
| 6    | M, Oct 1  | "Earliest hominin" candidates  | Su, 2013                   |
|      | W, Oct 3  | Australopiths: eastern and central Africa  | Ward & Hammond 2016        |
|      | Lab       | <b>Lab 5: Fossil apes</b>  |                            |
| 7    | M, Oct 8  | Fall Break (no class)  |                            |
|      | W, Oct 10 | Australopiths: southern Africa   | N/A                        |
|      | Lab       | <b>Lab 6: Early hominins</b>   |                            |
| 8    | M, Oct 15 | Review of material & opportunity for questions   | N/A                        |

|    |           |   |                                    |
|----|-----------|---|------------------------------------|
|    | W, Oct 17 | EXAM I  |                                    |
|    | Lab       | No lab meeting  |                                    |
| 9  | M, Oct 22 | Hyper-megadont archaic hominins   | Constantino, 2013                  |
|    | W, Oct 24 | <i>Homo habilis</i><br><u>Assignment:</u> Adaptive trends presentations | Schwartz & Tattersall 2015         |
|    | Lab       | <b>Lab 7: Australopiths vs Homo</b>                                     |                                    |
| 10 | M, Oct 29 | <i>Homo erectus</i> : origins and dispersal beyond Africa               | Carotenuto <i>et al.</i> , 2016    |
|    | W, Oct 31 | <i>Homo erectus sensu stricto</i>                                       | Van Arsdale, 2013                  |
|    | Lab       | <b>Lab 8: Inter- and intra- specific variation</b>                      |                                    |
| 11 | M, Nov 5  | Later archaic <i>Homo</i>   | Bae, 2013                          |
|    | W, Nov 7  | Neanderthals and contemporaries: fossil evidence                        | Churchill 2014 (Chap 2)            |
|    | Lab       | <b>Lab 9: Homo</b>  |                                    |
| 12 | M, Nov 12 | Neanderthals and contemporaries: behavior and molecular evidence        | Reich <i>et al.</i> 2010           |
|    | W, Nov 14 | AMHS: fossil evidence   | Stringer 2014                      |
|    | Lab       | <b>Lab 10: Neanderthals</b>   |                                    |
| 13 | M, Nov 19 | Evolutionary trends: diet and dentition (instructor example)            | Sponheimer <i>et al.</i> 2013 + SI |
|    | W, Nov 21 | Thanksgiving Break (no class)   |                                    |
|    | Lab       | No lab - prep your presentations  |                                    |
| 14 | M, Nov 26 | AMHS: behavior  | McBrearty & Brooks 2000            |
|    | W, Nov 28 | Evolutionary trends (student presentation)                              | TBD                                |
|    | Lab       | <b>Lab 11: AMHS</b>   |                                    |
| 15 | M, Dec 3  | Evolutionary trends (student presentation)                              | TBD                                |
|    | W, Dec 5  | Evolutionary trends (student presentation)                              | TBD                                |
|    | Lab       | No lab meeting<br>Send review questions COB Wednesday                   | N/A                                |
|    | M, Dec 10 | Review of material & opportunity for questions                          | N/A                                |
|    | Dec 12-20 | <b>EXAM 2</b> (date & time TBD)   |                                    |