OXFORD COLLEGE
Fall Semester 2016

ANTHROPOLOGY 201Q

Concepts and Methods in Biological Anthropology

(Class # 4105 & 4107; ANTH_OX 201Q.01J & 02A1 SNT with Lab)
TuTh 1:40 pm – 3:00 pm Pierce 109
MoWe 2:30 pm – 3:50 pm Pierce 109
Labs Tu or Th 9:45 am – 12:45 pm in Pierce 109

Professor: Dr. Aaron Stutz
Office: Language Hall 211
e-mail: astutz@emory.edu
phone: 770-784-8349
Office Hours: by appointment (PLEASE DON'T BE SHY – includes office or skype times Mo-Fr)

Biological Anthropology – Inquiry into Human Diversity and Identity in Evolutionary Perspective

Using human evolution as a case study, we will investigate the following questions:

i. **What is biological evolution? Why is it not at all just survival of the fittest?**
ii. **How do we study microevolution—that is, changes in genetic *allele* frequencies in populations over an observable number of generations?**
iii. **How do we use genetic analysis and fossil studies to extrapolate from microevolution to macroevolution (adaptation, speciation, extinction, and deep ecosystem structure)?**
iv. **What is an adaptation, and how do adaptations evolve?**
v. **What is a species, how do species evolve and—eventually—go extinct?**

Synthesizing our answers to these questions, we will conclude by asking:

- ***Why do humans vary so much within a single species, and how do the concepts of adaptation and speciation help us to understand that variation?***
- ***Why does the modern human pattern of variation provide evidence to falsify our common ideas about human races?***

ANTHROPOLOGY 201Q w/Lab as an INQUIRY COURSE:

In this course, there is plenty of hands-on and case-study engagement with tangible evidence—anatomical models, fossil casts, summaries of gene sequences in populations. But we're going to work on relating inquiry about evidence to more abstract questions.

The questions may be abstract, but they have to do with learning about learning, well beyond the professional concerns of biologists and anthropologists, medical clinicians and demographers. The questions are about figuring out how and why we inquire scientifically into our place in the natural world.

Thus, our learning goals focus on how to ask the right questions about human biology and ecology—and how to identify and evaluate the right kinds of evidence. In this way, Anthro 201Q is part of Oxford College's Learning through Inquiry curriculum.

By the end of this course, you should be able to answer and logically explain the following very general questions, linking your definitions and concepts to specific examples:

- ***What is the scientific method?***
- ***Why is it necessary to pose critical but practically testable (falsifiable) hypotheses in order to develop new knowledge?***
- ***Yet, why is any such resulting new <u>scientific</u> knowledge not unambiguous, absolute truth?***
- ***And why is scientific inquiry into unknown or uncertain aspects of the world important to you?***

In dealing with these questions, you will likely formulate your own important ones, too. We will use written reflections—in INQ essays and exam essays—to evaluate how well we are forming our answers.

As we progress, you will become better able to separate evidence from definitional concepts … and separate both of those from claims and explanations that integrate and contextualize that evidence with key general concepts in biology and anthropology. In turn, you will gain practical experience and richer knowledge about how to make these general aspects of inquiry your own—across scholarly disciplines, in professional work settings, and beyond.

REQUIRED READINGS

Required e-coursepack and website readings will be posted on Anthro 201Q's Canvas page: http://emory.instructure.com. The e-coursepack readings will be in PDF format. The readings are a combination of popular science and scholarly articles and book chapters, introducing you to concepts and scientific arguments in biological anthropology, along with examples of actual research.

There is no assigned textbook. Required reference resources are provided on this syllabus and in lab handouts, with links to publicly available websites:

http://evolution.berkeley.edu/evolibrary/article/evo_01

http://humanorigins.si.edu/evidence

http://ghr.nlm.nih.gov/

Additional online reference resources are available on the Anthro 201Q resource page: https://bioculturalevolution.net/anthro-201q/

LAB AND EXERCISE COMPOSITION BOOK

The readings, lab assignments, lab review prompts, in-class worksheets, essay assignments, and final reflection assignment will all be posted on Canvas, so that you can access them during permitted times in class and lab. *You are thus required to bring a laptop computer or tablet class and lab.* Smartphone screens are likely too small to read all content we will be accessing in class. While readings and assignments will be available electronically, you must write all of your short answer, essay, and description responses in a COMPOSITION BOOK devoted to Anthro 201Q with Lab. (No spiral notebooks or looseleaf folders or binders will be accepted.) Your composition books will occasionally be collected to evaluate your lab and participation grades.

CELL-PHONE AND COMPUTER ETIQUETTE

Unless you're waiting to hear whether your sister had a boy or a girl, or you have a family member who is facing a medical emergency, cell-phones must be put away during class and lab time. Tablets or laptops, however, are necessary during certain parts of class and most of lab. Tablets and personal computer screens, of course, can allow students to access distracting content and applications. Thus, class and lab time devoted to lecture, discussion, and documentary films is personal-screen-free time. Students observed by the instructor using screens in violation of these course rules will be counted absent that day. Your tablets and computers may only be used during permitted times. Dr. Stutz will clearly indicate when they are allowed and when they must be put away.

COURSE GRADES

Your grades are assigned on an absolute scale. What this means is that if everyone in the course performs at an excellent level, then everyone will receive an A.

Your grades will be based on the following attendance, lab, essay, and exam components :

- **Lecture/Discussion Attendance: 10 points (24 lecture meetings, 0.5 points per lecture, so there are four unexcused absences … no extra points for perfect attendance beyond 20)**
- **Lab Attendance: 10 points (1 point per lab; no unexcused absences)**
- **Lab Exercise Completion: 10 points (based on grading your lab composition books on a Satisfactory/Unsatisfactory basis, 1 point per lab)**
- **Two Take-Home Essay Exams: 30 points (15 points per essay exam)**
- **INQ Lab Essays #1-4: 20 points (each essay is graded on a 5-point scale)**
- **Final INQ Essay: 10 points**
- **Annotated lab composition book: 5 points**
- **Final Reflective Essay: 5 points**

NOTE: Your grade will of 20% attendance and 20% completion of reading, discussion, lab, and reflective essay exercises. The remainder will consist of 60% critical thinking and writing achievement—based on essay rubrics you will receive—for your four smaller INQ essays, essay exams, and final INQ essay. In order to achieve an A- or higher in the course, you need to have at least a B+ grade average on the INQ essays and exams. If you have at least a B+ average (at least 52 out of 60 points on the INQ essays and exams), you can earn an A- course grade with near-perfect attendance lab composition book and reflective essay grades, totaling 39 out of 40). Thus, the most opportunities to achieve a high grade in the course come with consistent attendance in lecture and lab. This will also make learning more efficient for you. Of course, the arithmetic means that you need at least a 91 in the course to earn an A-.

ANOTHER KEY NOTE: As the grade A is awarded to the highest level of excellence, you must earn a total of at least 93 points in the course for an A.

IMPORTANT: Remember that you are bound to follow assignment and exam instructions according to the Honor Code of Oxford College. You may collaborate in studying for exams and in preparing outlines for your INQ assignments, but cheating and plagiarizing are simply Honor Code violations. Do not cheat on INQ essays, exams, and reflective essays, and turn in work that you yourself thought of, wrote, and drew.

JUST AS IMPORTANT: The exams, final INQ essay and final reflective essay are MANDATORY. A failure to complete any one of these will result in a failing grade for the course.

STILL JUST AS IMPORTANT: Unless you have a valid excuse that you present to me beforehand, *all exam and due dates must be strictly adhered to*. RARE EXCEPTIONS are granted under the following clear conditions: you have a valid, documented medical or family *emergency*. If you require special arrangements through Disability Services, or if you otherwise know ahead of time that you have a major schedule conflict, contact the professor as soon as possible to schedule an alternative exam. Be prepared to provide documentation.

LABS:

Labs will meet in Pierce 109. The Tuesday and Thursday morning lab slots meet between 9:45 am and 12:45 pm. Lab activities will begin promptly at the beginning of the meeting time. Because those activities involve group work and discussion, being late will be disruptive for your classmates. Please be on time. Late arrival will result in a fraction of a point removed from attendance.

Lab attendance is required. There will be a total of 10 lab meetings over the semester. You may attend the other lab section to make up an absence. You will be responsible for any material that you missed in lab on lab reports, exams, and INQ essays.

Lab activities are designed to help you learn about key concepts and phenomena in human and primate biology and evolution, as you develop the tools to inquire into questions about what evolutionary forces shape human variation.

KEY DATES TO REMEMBER

Exam I -	**In class, Wed/Thu September 23-24**
Exam II -	**In class, Wed/Thu October 28-29**
Final INQ Reflective Essay -	**On SafeAssign, Mon December 14 by 5 pm**

THIS SYLLABUS IS SUBJECT TO CHANGE AT THE PROFESSOR'S DISCRETION
ANY CHANGES WILL BE ANNOUNCED IN CLASS.

Anthropology 201Q w/Lab
Syllabus

ALL LABS MEET THE TUESDAY OR THURSDAY THEY ARE LISTED ON THE SYLLABUS

Week 1 Introduction

Wed/Thu Aug 24-25 – *Human Diversity in Evolutionary Perspective*

E-COURSEPACK:
1-Alemseged et al. – The Dikika Child

Week 2 Darwin's Impact on How We Investigate Nature

Mon/Tue Aug 29-30 – *What's the Big Deal with Darwin?*

E-COURSEPACK:
2-Weiner - Beak of the Finch Ch. 1
3-Weiner – Beak of the Finch Ch. 2

WEB READINGS:
http://evolution.berkeley.edu/evolibrary/article/0_0_0/history_01
http://evolution.berkeley.edu/evolibrary/article/0_0_0/history_14

Wed/Thu Aug 31-Sep 1 – *Biological Anthropology – The Holistic Science of Us*

WEB READINGS:
http://bioculturalevolution.net/biocultural-overview/
http://bioculturalevolution.net/the-human-niche-an-overview/
http://bioculturalevolution.net/2013/06/12/non-nested-hierarchy-and-the-human-niche/

BLACKBOARD Lecture – *The Origin of Species and the Evolution/Creationism Debate*

E-COURSEPACK:
4-Alonso & Ricardo – Life on Earth
5-Talbot – Darwin in the Dock
6-Brumfiel – Intelligent Design

LAB#1 INQUIRY: WHY DO HUMANS VARY ANATOMICALLY?

LAB DISCUSSION: THE CONTROVERSY ABOUT TEACHING EVOLUTION

Week 3 Biomolecular Genesis: The Genetics of Life … Including Us

NOTE: No lecture meetings Monday or Tuesday due to Labor Day Holiday – Lab will meet as scheduled on Tuesday and Thursday at 9:45

Wed/Thu Sep 7-8 – *What's the Difference between Genetics and Genomics?*

E-COURSEPACK:
7-Weiss – Good Vibrations

WEB READINGS:
http://ghr.nlm.nih.gov/handbook/basics?show=all
http://ghr.nlm.nih.gov/handbook/howgeneswork?show=all
http://ghr.nlm.nih.gov/handbook/traits?show=all
http://ghr.nlm.nih.gov/handbook/hgp?show=all
http://ghr.nlm.nih.gov/handbook/genomicresearch?show=all
http://evolution.berkeley.edu/evolibrary/article/evo_14
http://evolution.berkeley.edu/evolibrary/article/0_0_0/evo_16
http://evolution.berkeley.edu/evolibrary/article/0_0_0/evo_17
http://evolution.berkeley.edu/evolibrary/article/0_0_0/evo_18
http://evolution.berkeley.edu/evolibrary/article/0_0_0/evo_19
http://evolution.berkeley.edu/evolibrary/article/0_0_0/evo_20
http://evolution.berkeley.edu/evolibrary/article/0_0_0/evo_21
http://evolution.berkeley.edu/evolibrary/article/0_0_0/evo_22
http://evolution.berkeley.edu/evolibrary/article/0_0_0/evo_23
http://evolution.berkeley.edu/evolibrary/article/0_0_0/evo_24
http://evolution.berkeley.edu/evolibrary/article/0_0_0/evo_25

LAB #2 INQUIRY: WHAT IS GENETIC INHERITANCE, AND WHAT DO OUR GENOMES HAVE TO SAY ABOUT US?

LAB DISCUSSION: HOW MUCH OF OUR GENOMIC INFORMATION SHOULD BE PRIVATE? WHAT DOES GENOMIC KNOWLEDGE TEACH US ABOUT BEING HUMAN?

Fri Sep 9 – DUE ON CANVAS at 9 am: INQ Lab Essay #1: KNOWLEDGE, TRUTH, AND INQUIRY

Week 4 Evolutionary Theory – From Micro to Macro

Mon/Tue September 12-13 – *Microevolution in Human Populations*

E-COURSEPACK:
8-Mayr – Darwin's Legacy

WEB READINGS:
http://evolution.berkeley.edu/evolibrary/article/0_0_0/history_05
http://evolution.berkeley.edu/evolibrary/article/0_0_0/history_06
http://evolution.berkeley.edu/evolibrary/article/0_0_0/history_07
http://evolution.berkeley.edu/evolibrary/article/0_0_0/history_08
http://evolution.berkeley.edu/evolibrary/article/0_0_0/history_09
http://evolution.berkeley.edu/evolibrary/article/0_0_0/history_12
http://evolution.berkeley.edu/evolibrary/article/0_0_0/history_13
http://evolution.berkeley.edu/evolibrary/article/0_0_0/history_18
http://evolution.berkeley.edu/evolibrary/article/0_0_0/history_19
http://evolution.berkeley.edu/evolibrary/article/0_0_0/history_20

Wed/Thu September 14-15 – *Adapting to Malaria*

E-COURSEPACK:
9-Livingstone – Anthropological Implications of the Sickle-Cell Gene
10-Piel et al – Global Evidence for the Malaria Hypothesis

WEB READINGS:
http://evolution.berkeley.edu/evolibrary/article/0_0_0/history_21
http://evolution.berkeley.edu/evolibrary/article/0_0_0/evo_42
http://evolution.berkeley.edu/evolibrary/article/0_0_0/evo_44
http://evolution.berkeley.edu/evolibrary/article/0_0_0/evo_45
http://evolution.berkeley.edu/evolibrary/article/evo_47
http://evolution.berkeley.edu/evolibrary/article/0_0_0/evo_48

LAB #3 INQUIRY: HOW DOES MICROEVOLUTION LEAD TO SPECIATION? HOW DOES MICROEVOLUTION SHAPE PHENOTYPIC TRAITS OVER THE GENERATIONS? WHY DO SPECIES GO EXTINCT?

Week 5 **EXAM I – Learning Objectives *i* and *ii***

i. *What is biological evolution? Why is it not at all just survival of the fittest?*

ii. *How do we study microevolution—that is, changes in genetic allele frequencies in populations over an observable number of generations?*

Mon Sep 19 – DUE ON CANVAS at 9 am: INQ Lab Essay #2: INHERITANCE, VARIATION, AND SELECTION—FROM INDIVIDUALS TO POPULATIONS

ONLINE REVIEW SESSION – time TBA

FRI Sep 23 – DUE ON CANVAS at 9 am: TAKE-HOME EXAM #1: MICROEVOLUTION IN HUMAN POPULATIONS

NO CLASS OR LAB THIS WEEK – DR. STUTZ AWAY AT A CONFERENCE IN COPENHAGEN!

Week 6 Inquiry into Adaptation and Speciation

Mon/Tue Sep 26-27 – *Investigating Adaptation and Speciation*

E-COURSEPACK:
11-Wood & Riesenberg – Introduction to Speciation
12-Reznick & Ghalambor – Observing Rapid Adaptation

Wed/Thu Sep 28-29 – *Speciation and Adaptation in Our Primate Cousins*

E-COURSEPACK:
13-Milton – Primate Diets
14-DeWaal et al – Overcrowding and Social Behavior

BLACKBOARD Lecture – *Meet the Primates*

WEB READING:
http://humanorigins.si.edu/evidence/genetics

LAB #4 INQUIRY: PRIMATE EVOLUTIONARY ANATOMY AND BEHAVIORAL ECOLOGY

Week 7 Studying Hominin Evolutionary Emergence

Mon/Tue Oct 3-4 - ***Reading Washburn – What is Physical / Biological Anthropology … and When do Humans Evolve?***

E-COURSEPACK:
15-Washburn – The New Physical Anthropology
16-Washburn – Primate Evolution and Human Origins

BLACKBOARD Lecture – *The Great Apes in Comparative Perspective*

E-COURSEPACK:
17-DeWaal – Bonobo Societies
18-Whiten & Boesch – Chimpanzee Cultures

Wed/Thu Oct 5-6 - ***The Hominin Lineage***

E-COURSEPACK:
19-Leonard – Food for Thought
20-Coppens – East Side Story

LAB #5 INQUIRY: HOW DID SPECIATION AND ADAPTATION LEAD TO THE EVOLUTIONARY DIVERGENCE BETWEEN HUMANS AND CHIMPS/BONOBOS?

Fri – DUE ON CANVAS at 9 am: INQ Lab Essay #3: MACROEVOLUTION IN OUR PAST—SPECIATION AND ADAPTATION IN EARLY HOMININ ECOSYSTEMS

Week 8 Ardipithecines and Australopithecines

Wed/Thu Oct 12-13 – *Canines, Bipedalism, Birth, and Hominin Sociality*

E-COURSEPACK:
21-Lovejoy – Understanding Ardi's Evolution
22-Leakey & Walker – Australopiths
23-Lovejoy – Bipedalism
24-Rosenberg & Trevathan – Giving Birth

NOTE: No lecture meetings Monday or Tuesday and no lab meetings Tuesday or Thursday due to Fall Break

Week 9 Adaptation and Speciation in Early Hominin Evolution

Mon/Tue Oct 17-18 – *From Australopithecines to the Genus Homo*

E-COURSEPACK:
25-Ackermann & Smith – Hominin Speciosity

Wed/Thu Oct 19-20 – *Reading Schick & Toth - Making Silent Stones Speak*

E-COURSEPACK:
26-Schick & Toth – Ch. 3
27-Schick & Toth – Ch. 4

LAB #6 INQUIRY: HOW DID SPECIATION AND ADAPTATION SHAPE THE EARLY EVOLUTION OF THE HOMININS, ca. 7-2 mya?

Week 10 Exam II – Learning Objectives *iii*, *iv*, and *v*

i. How do we use genetic analysis and fossil studies to extrapolate from microevolution to macroevolution (adaptation, speciation, extinction, and deep ecosystem structure)?
ii. What is an adaptation, and how do adaptations evolve?
iii. What is a species, how do species evolve and—eventually—go extinct?

MON Oct 24 – DUE ON CANVAS at 9 am: INQ Lab Essay #4—BECOMING HOMININ … FOSSIL AND ARCHAEOLOGICAL EVIDENCE FOR MACROEVOLUTION IN THE HUMAN LINEAGE, 7-2 million years ago (MYA)

Mon/Tue Oct 26-27 – *Review*

Wed/Thu Oct 28-29 – *Revision of INQ Lab Essay #4/Prep for Exam II*

NO LAB THIS WEEK

MON OCT 31 – DUE ON CANVAS at 9 am: TAKE-HOME EXAM #2: SPECIATION AND ADAPTATION IN EARLY HOMININ EVOLUTION

Week 11 The Evolution of the Genus *Homo*

Mon/Tue Oct 31-Nov 1 - ***Out of Africa, Episode I***

In-Class exercise – Reading Jablonksi – What does bipedalism have to do with our misperceptions of racial difference?

E-COURSEPACK:
28-Wong – Stranger in a New Land
29-Jablonski – The Evolution of Hairlessness

Wed/Thu November 2-3 – ***Investigating Neandertal Origins***

E-COURSEPACK:
30-Wong – Who Were the Neandertals?

WEB READING:
http://bioculturalevolution.net/2013/12/25/whos-a-freak/

LAB #7 INQUIRY: WHY DID THE GENUS Homo SPREAD THROUGHOUT THE "OLD WORLD" … AND WHAT CAUSED ITS EVOLUTION?

Week 12 The Great Debate – Who's Who in the Genus *Homo*?

Mon/Tue Nov 7-8 – *The Origins of Anatomically Modern Humans*

E-COURSEPACK:
31-Bar-Yosef & Vandermeersch – Moderns and Neandertals in the Levant
32-Wong – The Modern Mind
33-Tattersall – We Were Not Alone
34-Thorne & Wolpoff – Multiregional Evolution

Wed/Thu Nov 9-10 – *DNA Analysis, Neandertals, and Denisovans … And Who are the Denisovans Anyway?*

E-COURSEPACK:
35-Wong – Twilight of the Neandertals
36-Gibbons – Close Encounters

WEB READINGS:
http://news.nationalgeographic.com/news/2014/01/140129-neanderthal-genes-genetics-migration-africa-eurasian-science/
http://bioculturalevolution.net/2014/10/30/neandertals-early-modern-humans-and-us/

LAB #8 INQUIRY: WHAT EVOLUTIONARY FORCES AND ECOLOGICAL FACTORS CAUSED THE EMERGENCE OF NEANDERTALS AND ANATOMICALLY MODERN HUMANS?

Week 13 **INQUIRY: UNDERSTANDING MICRO AND MACROEVOLUTION IN THE HUMAN PAST AND PRESENT – Synthetic Learning Objective on why we're all one species today**

Mon/Tue Nov 14-15 – *Speciation, Adaptation, and Extinction in Human Evolution*

E-COURSEPACK:
37-Wong-The Littlest Human
38-Wong-Hobbit Hullabaloo
39-Wong-New Views on the Hobbit
40-Schroeder et al – Evolution of the Genus Homo

WEB READINGS:
http://www.scientificamerican.com/article/mysterious-new-human-species-emerges-from-heap-of-fossils/
http://www.scientificamerican.com/article/extinct-tree-climbing-human-walked-with-a-swagger/

Wed/Thu Nov 16-17 – *Globalization, Demographic Transitions, Epidemiological Transitions, and Regional Adaptations*

In-Class Inquiry – What's Changed in Human Biology that Might Have Contributed to Globalization and Population Growth?

E-COURSEPACK:
41-Hill et al – The Human Niche

Lab #9 Inquiry: How Has Globalization Changed Human Biological Variation, Part I?

Week 14 **THANKSGIVING BREAK**

NO CLASSES WEEK OF NOV 21-25 – THANKSGIVING HOLIDAY

Week 15 *Homo sapiens* as a Global, Genetically Interconnected Species

Mon/Tue Nov 28-29 – *The Scientific Myth of Race*

E-COURSEPACK:
42-Relethford – Admixture
43-Relethford – Palimpsests of the Past

Wed/Thu Nov 30-Dec 1 – *Clines!*

E-COURSEPACK:
44-Caspari – Evolution of Grandparents
45-Byars – Natural Selection in America
46-Pringle – Long Live the Humans
47-Stulp et al. – Recent Selection for Stature
Review 9 - Livingston - Anthropological Implications of the Sickle-Cell Gene

WEB READINGS:
http://evolution.berkeley.edu/evolibrary/news/070401_lactose
http://www.nature.com/scitable/topicpage/evolutionary-adaptation-in-the-human-lineage-12397

LAB #10 INQUIRY: How Has Globalization Changed Human Biological Variation, Part II?

Week 16 Human Evolution as Biocultural Evolution

Mon/Tue Dec 5-6 – *Discussion: Biocultural Evolution … For Good and Bad*

Week 17 FINAL ASSIGNMENTS

MON Dec 12 – DUE ON CANVAS by 9:00 am: FINAL INQ ESSAY—EXPLANATION AND EVIDENCE FOR WHAT *YOU* ARGUE HAS CHANGED IN HUMAN BIOLOGICAL VARIATION DURING GLOBALIZATION

MON Dec 12 – DUE OUTSIDE DR. STUTZ'S OFFICE, LANG 211—ANNOTATED LAB COMPOSITION BOOK

WED Dec 14 – DUE ON CANVAS by 5 pm: FINAL REFLECTIVE ESSAY
THIS IS YOUR FINAL ASSIGNMENT FOR THE COURSE. PLEASE TURN IT IN PROMPTLY!!! Grades will be posted by Thu Dec 15

Here is your FINAL REFLECTIVE ESSAY prompt:

THIS 3-4 PAGE ESSAY WILL BE A FOCUSED REVIEW OF GENERAL LEARNING GOALS—EXPLAIN HOW CONCEPTS, EVIDENCE, AND ARGUMENTS YOU'VE ENGAGED WITH AND DEVELOPED IN THIS COURSE HELP YOU TO ADDRESS THE GENERAL LEARNING GOALS, ANSWERING:

- *What is the scientific method?*
- *Why is it necessary to pose critical but practically testable (falsifiable) hypotheses in order to develop new knowledge?*
- *Yet, why is any such resulting new scientific knowledge not unambiguous, absolute truth?*
- *And why is scientific inquiry into unknown or uncertain aspects of the world important to you?*