OXFORD COLLEGE
Fall Semester 2015

ANTHROPOLOGY 201Q

Concepts and Methods in Biological Anthropology

(Class # 4968 & 4970; ANTH_OX 201Q.01J & 02A1 SNT with Lab)

TuTh 1:40 pm – 3:00 pm Lang 101
MoWe 2:30 pm – 3:50 pm Lang 101
Labs 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 times Mo-Th and Skype times 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 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 will be posted on Anthro 201Q's Blackboard page.

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/

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.

The exams and assignments will be weighted as follows:

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 & Lab Exercise Completion: 20 points (9 lab meetings, two points per lab, one unexcused absence, so you start with 4 points … no extra points beyond 20)

Two In-Class Essay Exams: 30 points (15 points per essay exam)

INQ Lab Essays #1 through 6: 30 points (each essay is graded on a 5-point scale)

Final Reflective Essay: 10 points

NOTE: Your grade will thus consist of 30% participation and completion of reading, discussion, and lab exercises during the lecture and lab sections. The remainder will consist of 70% critical thinking and writing achievement—based on essay rubrics you will receive—for your INQ essays, and essay exams. In order to achieve an A- or higher in the course, you need to have at least a B+ grade average on the INQ lab essays, exams, and final reflective essay. If you have at least a B+ average (at least 62 out of 70 points on the essays and exams), you can earn an A- course grade with near-perfect attendance and participation in lecture and labs, totaling 29 out of 30). 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 your lab/response paper assignments, but cheating and plagiarizing are simply Honor Code violations. Do not cheat on exams and turn in work that you yourself thought of, wrote, and drew.

JUST AS IMPORTANT: The exams 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.

Lab attendance is required. There will be a total of 9 lab meetings over the semester, and you are allowed only one unexcused absence. After this one absence, only documented family emergencies and illnesses will excuse an absence, and you will be encouraged to make up the exercises. 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 26-27 –*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 31-Sep 1 – *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 RESOURCES:
http://evolution.berkeley.edu/evolibrary/article/0_0_0/history_01
http://evolution.berkeley.edu/evolibrary/article/0_0_0/history_14

Wed/Thu Sep 2-3 – *Biological Anthropology – The Holistic Science of Us*
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 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 at 9:45

Wed/Thu Sep 9-10 – *What's the Difference between Genetics and Genomics?*

E-COURSEPACK: 7-Weiss – Good Vibrations

WEB RESOURCES:

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

Week 4 Evolutionary Theory – From Micro to Macro

BLACKBOARD Lecture – *The Modern Synthesis*
E-COURSEPACK: 8-Mayr – Darwin's Legacy
WEB RESOURCES:
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

Mon/Tue September 14-15 – *Microevolution in Human Populations*
E-COURSEPACK: 9-Livingstone – Anthropological Implications of the Sickle-Cell Gene
10-Piel et al – Global Evidence for the Malaria Hypothesis

Wed/Thu September 16-17 – *Speciation in human evolution*
E-COURSEPACK: 11-Wood & Riesenberg – Introduction to Speciation
WEB RESOURCES:
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 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

Mon – DUE ON SAFEASSIGN at 9 am: INQ Lab Essay #2: MICROEVOLUTION IN HUMAN POPULATIONS—EVIDENCE AND KNOWLEDGE

Mon/Tue September 21-22 – *Review*

Wed/Thu September 23-24 – *EXAM I – ESSAY EXAM IN CLASS*

NO LAB THIS WEEK

Week 6 Primatology – Inquiry into Adaptation and Speciation

BLACKBOARD Lecture – *Meet the Primates*
WEB RESOURCES:
http://humanorigins.si.edu/evidence/genetics

BLACKBOARD Lecture – *Variation in Primate Adaptation*

Mon/Tue Sep 28-29 – *Reading Reznick and Ghalambor – Investigating Adaptation*
E-COURSEPACK: 12-Reznick & Ghalambor – Observing Rapid Adaptation

Wed/Thu Sep 30-Oct 1 – *Reading Milton and DeWaal – Studying Primate Foraging and Social Behavior*
E-COURSEPACK: 13-Milton – Primate Diets
14-DeWaal et al – Overcrowding and Social Behavior

LAB INQUIRY: PRIMATE EVOLUTIONARY ANATOMY AND BEHAVIORAL ECOLOGY

Week 7 Studying Hominin Evolutionary Emergence

BLACKBOARD Lecture – *Human Evolution as Primate Evolution*

Mon/Tue Oct 5-6 – *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

BLACKBOARD Lecture – *The Great Apes in Comparative Perspective*

E-COURSEPACK: 19-Leonard – Food for Thought

Wed/Thu Oct 7-8 – *Reading Lovejoy – The big deal with Ardi*

E-COURSEPACK: 20-Lovejoy – Understanding Ardi's Evolution

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

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

Week 8 Ardipithecines and Australopithecines

BLACKBOARD Lecture – *The Origin of the Hominins*

Wed/Thu Oct 14-15 – *Reading Coppens, Leakey & Walker – What happened with the transition from Ardipithecines to Australopithecines?*

E-COURSEPACK: 21-Coppens – East Side Story
22-Leakey & Walker – Australopiths

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

BLACKBOARD Lecture – *Canines, Bipedalism, Birth, and Hominin Sociality*
E-COURSEPACK: 23-Lovejoy – Bipedalism
24-Rosenberg & Trevathan – Giving Birth

Mon/Tue Oct 19-20 – *Reading Ackermann & Smith – What did speciation have to do with adaptation in early human evolution?*
E-COURSEPACK: 25-Ackermann & Smith – Hominin Speciosity

BLACKBOARD Lecture – From Australopithecines to the genus *Homo*

Wed/Thu Oct 21-22 – *Reading Schick & Toth – Making Silent Stones Speak*
E-COURSEPACK: 26-Schick & Toth – Ch. 3
27-Schick & Toth – Ch. 4

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

Week 10 Exam II

MON – DUE ON SAFEASSIGN 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 – *EXAM II – ESSAY EXAM IN CLASS*

NO LAB THIS WEEK

Week 11 The Evolution of the Genus Homo

BLACKBOARD Lecture – *Out of Africa, Episode I*
E-COURSEPACK: 28-Wong – Stranger in a New Land

Mon/Tue Nov 2-3 – *Reading Jablonksi – What does bipedalism have to do with our misperceptions of racial difference?*
E-COURSEPACK: 29-Jablonski – The Evolution of Hairlessness

BLACKBOARD Lecture – *Neandertals and Other Regional Populations*

Wed/Thu November 4-5 – *Investigating Neandertal Origins*
Text: Jurmain et al. – Chapter 12
E-COURSEPACK: 30-Wong – Who Were the Neandertals?
WEB RESOURCES:
http://bioculturalevolution.net/2013/12/25/whos-a-freak/

LAB 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 9-10 – *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 11-12 – *DNA Analysis, Neandertals, and Denisovans … And Who are the Denisovans Anyway?*

Online Resource: Yong - Surprise! 20 Percent of Neanderthal Genome Lives On in Modern Humans, Scientists Find

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

WEB RESOURCES:
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 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

Mon/Tue Nov 16-17 – *The Hobbit and the Genus* Homo
E-COURSEPACK: 37-Wong-The Littlest Human
38-Wong-Hobbit Hullabaloo
39-Wong-New Views on the Hobbit

Wed/Thu Nov 19-20 – *IN-CLASS WORK ON INQ Lab Essay #5: Speciation, Adaptation, and Extinction in Human Evolution*

FRI – DUE ON SAFEASSIGN at 9 am: INQ Lab Essay #5—FOSSIL AND ARCHAEOLOGICAL EVIDENCE FOR GLOBALIZATION OF THE HUMAN ADAPTATION … AND THE HUMAN NICHE

NO LAB THIS WEEK

Week 14 THANKSGIVING BREAK

NO CLASSES – THANKSGIVING HOLIDAY

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

BLACKBOARD Lecture – *The Lemba*

Mon/Tue Nov 30/Dec 1 – *Reading Relethford – The Scientific Myth of Race*
E-COURSEPACK: 40-Relethford – Admixture

BLACKBOARD Lecture – *Genetics and Genealogical Relatedness*
E-COURSEPACK: 41-Relethford – Palimpsests of the Past

Wed/Thu Dec 2-3 – *Clines!*
Text: Review 9 - Livingston - Anthropological Implications of the Sickle-Cell Gene

LAB INQUIRY: ***IF RACE DOESN'T DESCRIBE MAJOR GEOGRAPHIC PATTERNS OF HUMAN VARIATION, THEN HOW DO WE ACTUALLY VARY BIOLOGICALLY … AND WHY?***

Week 15 Natural Selection and Adaptation in Human Populations

BLACKBOARD Lecture – *Adaptation and Natural Selection Today*

BLACKBOARD Lecture – *The Human Life History Strategy*

Mon/Tue Dec 7-8 – *Discussion: Biocultural Evolution … For Good and Bad*

E-COURSEPACK: 42-Caspari – Evolution of Grandparents
43-Byars – Natural Selection in America
44-Pringle – Long Live the Humans
45-Stulp et al. – Recent Selection for Stature

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

TUE – DUE ON SAFEASSIGN by 11:59 pm: INQ Lab Essay #6—SKELETAL AND GENETIC EVIDENCE GENE FLOW AND NATURAL SELECTION IN MODERN HUMAN POPULATIONS

Mon Dec 14 – DUE ON SAFEASSIGN by 5 pm: INQ Final Reflective Essay
THIS IS YOUR FINAL ASSIGNMENT FOR THE COURSE. PLEASE TURN IT IN PROMPTLY!!! Grades will be posted by Thu Dec 17

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?*