ANCIENT DNA
ANT 388 AND BIO 384K
SPRING 2013

COURSE INFORMATION: Unique #31440 and 50941
Wednesday 9 am – 12 pm, SAC 5.118

COURSE INSTRUCTOR: Dr. Deborah Bolnick
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Office Hours: SAC 4.148, Wednesdays 2-4 pm or by appointment

COURSE DESCRIPTION:
Ancient DNA can be obtained from the remains of organisms that have long been dead (and may now be extinct), and it can be retrieved from a variety of sources — human and animal remains, coprolites, seeds and other plant material, soil, and even some cultural artifacts. The study of ancient DNA makes it possible to directly assess genetic variation in the past, allowing us to track evolutionary changes over time and to reconstruct long-term population dynamics. Furthermore, when ancient DNA is considered in conjunction with archaeological evidence, it can help clarify the social structure, mating and postmarital residence patterns, kinship systems, and burial practices of ancient populations. It can also shed light on prehistoric population movements and interactions.

While ancient DNA studies have the potential to provide important and unique insights about evolution and human prehistory, there are significant challenges associated with the recovery and analysis of ancient DNA. This graduate course will explore the prospects and problems of ancient DNA research, and will consider applications of such research in anthropology, evolutionary biology, paleontology, and archaeology.

Discussion topics and readings will be selected based on the interests of students enrolled in this graduate course.

COURSE REQUIREMENTS:
1. Seminar Coordination (25%). Each student will co-organize and lead the class discussion on two days over the course of the semester. Student leaders are expected to (a) help select the assigned readings, (b) briefly present the core ideas found in the readings (PowerPoint slides or handouts may be prepared if you think they would be helpful), and (c) prepare a set of topics, questions, and other relevant classroom activities to help structure the class period and guide our discussion. You should consult with the instructor in office hours or by email as you select readings and prepare to lead the class discussion.

2. Class Participation (50%). Each student is expected to complete all assigned readings before class and participate fully in all discussions. To facilitate discussion, all students must come prepared with at least two questions and/or observations about each assigned reading.

3. Research Paper (25%). The research paper (approximately 10 pages, double-spaced) will allow you to explore a relevant topic of your choice in more detail. A 1-page synopsis or outline of your proposed topic (5%) is due by March 6. Your final paper (20%) is due on May 1.
**COURSE WEBSITE:**
Class information, handouts, and required readings will be available at the course website on Blackboard (http://www.courses.utexas.edu). Course updates will also be sent to your university e-mail account. Please check both regularly.

**CLASSROOM POLICIES:**
(1) Attend all classes and arrive on time whenever possible. (2) Do not use your cell phone, send emails or texts, or visit websites during class. (3) Please let me know if you have any problem that is preventing you from performing satisfactorily in this class.

**GRADING POLICIES:**
If the research paper is turned in late, the assignment grade will be lowered by 10% for each day that it is late. If a serious issue (i.e. illness, family death, etc.) arises that may prevent you from attending class or turning in the paper on time, contact me by e-mail or phone as soon as possible to discuss a make-up assignment or deadline extension.

Final letter grades will be assigned using the following scale: A (90-100%), B (80-89%), C (70-79%), D (60-69%), F (0-59%). Plus/minus grades will be assigned.

**Re-grading Policy:** If you believe your paper was graded incorrectly, submit a written request for a re-grade within one week of when the graded paper was returned. The written request should include an explanation of your position and be attached to the graded paper.

**Academic Dishonesty:** Each student in this course is expected to abide by the University of Texas Honor Code. Any work submitted by a student in this course for academic credit must be the student's own work. Any cheating or plagiarism will be reported to the Dean of Students, and the penalty may also include failure of the course and University disciplinary action. For more information, see http://www.lib.utexas.edu/services/instruction/learningmodules/plagiarism and http://deanofstudents.utexas.edu/sjs.

**Accommodations:** Students with disabilities or a chronic illness may request appropriate academic accommodations from the Division of Diversity and Community Engagement, Services for Students with Disabilities at http://www.utexas.edu/diversity/ddce/ssd, 471-6259 (voice), or 232-2937 (video phone). Please notify me as soon as possible of any accommodations that will be needed.

**Religious Holy Days:** By UT Austin policy, you should notify the instructor 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 in order to observe a religious holy day, I will give you an opportunity to make up the missed participation points within a reasonable time after the absence.

**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.
EMERGENCY EVACUATION POLICY:
Occupants of UT buildings are required to evacuate and assemble outside when a fire alarm is activated or an announcement is made. Please be aware of these evacuation policies:
(1) Familiarize yourself with exits to the classroom and building. The nearest exit may not be the one you used when you entered the building. (2) If you require assistance to evacuate, inform the instructor in writing during the first week of class. (3) In the event of an evacuation, follow the instructor’s directions. (4) Do not re-enter a building unless you’re given instructions by the Austin Fire Department, the UT Austin Police Department, or the Fire Prevention Services office.

SCHEDULE OF TOPICS, READINGS, AND IMPORTANT DATES:

January 16 Introduction  
- history of aDNA research; overview of the issues

January 23 Obtaining and Analyzing Ancient DNA (48 pp)  
Required Readings:

Additional Relevant References (Optional Readings):

January 30 Post-Mortem DNA Degradation and Preservation (50 pp)  
Required Readings:


**Additional Relevant References (Optional Readings):**


**February 6 Consequences of Postmortem Damage for PCR and DNA datasets (41 pp)**

**Required Readings:**


**Additional Relevant References (Optional Readings):**


**February 13  Detecting and Preventing Contamination (41 pp)**

**Required Readings:**


**Additional Relevant References (Optional Readings):**


**February 20  Authentication and Ethics of Ancient DNA Research (44 pp)**

**Required Readings:**


Kemp BM, Smith DG. 2010. Ancient DNA methodology: thoughts from Brian M. Kemp and David Glenn Smith on “Mitochondrial DNA of protohistoric remains of an Arikara
population from South Dakota”. Human Biology 82:227-238.

Additional Relevant References (Optional Readings):

February 27  Neandertals, Denisovans, and Human Evolution (36 pp)
Required Readings:

Additional Relevant References (Optional Readings)
Others to be announced.

March 6  Prehistoric Human Migration; Research Paper Synopsis/Outline Due
Readings TBA

March 13  No Class (Spring Break)

March 20  Biomolecular Archaeology
Readings TBA

March 27  Reconstructing Population Dynamics and Demographic History
Readings TBA

April 3  Phylogenetic and Demographic Inferences: Case Studies
Readings TBA

April 10  No Class (AAPA Meeting)
April 17    Estimating the Rate of Molecular Evolution
           Readings TBA

April 24   Paleopathology, Disease, and Ancient Microbes
           Readings TBA

May 1      Topic TBA; Research Paper Due
           Readings TBA