

**ANCIENT DNA**  
**ANT 388 AND BIO 384K**  
**SPRING 2016**

**COURSE INFORMATION:** Unique #30560 and 49114  
Wednesday 9 am – 12 pm, SAC 5.124

**COURSE INSTRUCTOR:** Dr. Deborah Bolnick  
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Office Hours: SAC 4.148, Wednesdays 3-5 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 and ethnohistoric 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 past population movements and interactions.

While ancient DNA studies have the potential to provide important and unique insights about evolution and human history, 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, archaeology, evolutionary biology, and paleontology. Discussion topics and readings will be selected based on the interests of students participating in this graduate course.

**COURSE REQUIREMENTS:**

- 1. Seminar Coordination (35%).** Each student will help lead the class discussion over the course of the semester. Student leaders are expected to (a) help select the assigned readings, and (b) come prepared with a set of topics, questions, and/or other 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. Discussion Agenda Items (35%).** This weekly assignment is intended to facilitate careful, critical thought about the readings before class. After completing the assigned readings, prepare an approximately ½ page-long set of agenda items for discussion (paragraph or bullet-point format is fine). Your agenda items may focus on one or more of the readings, and they may raise questions or concerns, discuss points that seem particularly important, synthesize material from multiple sources, suggest additional research that is needed, etc. Please email your agenda items to all course participants by 6 pm on the Tuesday preceding each class meeting. Additional topics can of course always be raised in class.
- 3. Class Participation (30%).** Each student is expected to complete all assigned readings before class and participate fully in all discussions.

**COURSE WEBSITE:**

Class information, handouts, and required readings will be available at the course website on Canvas (<http://www.canvas.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.
- (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.
- (4) No audio or video recording of any lecture or class activity is permitted without my prior written approval. The materials used in this class — including, but not limited to, exams, handouts, Powerpoint slides, and homework assignments — are copyright protected works. Any unauthorized copying of class materials is a violation of federal law and may result in disciplinary actions being taken against you. Sharing class materials without my specific, written approval may also be a violation of the University's Student Honor Code and an act of academic dishonesty, which could result in further disciplinary action. This includes, among other things, uploading class materials to websites for the purpose of sharing those materials with other current or future students.

**GRADING POLICIES:**

If a serious issue (i.e. illness, family death, etc.) arises that may prevent you from attending class or turning in your agenda items on time, contact me by e-mail or phone as soon as possible. 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.

**ACCOMODATIONS:**

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>, 512-471-6259 (voice), or 512-410-6644 (video phone). Notify me as soon as possible of any accomodations needed.

**RELIGIOUS HOLY DAYS:**

By UT Austin policy, you should notify Dr. Bolnick 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, exam, or assignment in order to observe a religious holy day, we will give you an opportunity to complete the missed work 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. Emergency evacuation routes and emergency procedures can be found at: [www.utexas.edu/emergency](http://www.utexas.edu/emergency). 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 COURSE MEETINGS AND TENTATIVE TOPICS:**

January 20	Introduction
January 27	Obtaining and Analyzing Ancient DNA
February 3	Post-Mortem DNA Degradation and Preservation
February 10	Contamination and Authentication of Ancient DNA
February 17	Ethical Issues in Ancient DNA Research
February 24	Topic TBD
March 2	Topic TBD
March 9	Topic TBD
March 16	<i>NO CLASS (SPRING BREAK)</i>
March 23	Topic TBD
March 30	Topic TBD
April 6	Topic TBD
April 13	Topic TBD
April 20	<i>NO CLASS (AWAY FOR FIELDWORK)</i>
April 27	Topic TBD
May 4	Topic TBD

### **OTHER POSSIBLE TOPICS:**

- reconstructing population dynamics and demographic history
- phylogenetic inferences from ancient DNA
- the Neandertal/Denisovan genomes and human evolution
- ancient human migration
- biomolecular archaeology
- plant and animal domestication
- reconstructing burial practices and kinship
- paleopathology, disease, and ancient microbial studies (including microbiomes)
- ancient Native American genomes and the initial peopling of the Americas
- animal ancient DNA studies
- estimating the rate of molecular evolution
- plant archaeogenetics
- genetic evolution during times of environmental change
- tracing the impact of natural selection through time
- whatever is of interest to students in the course!