Anthropology 744 Fall 2016
Topics in Biological Anthropology
Ancient Biomolecules
Course Outline

Seminar schedule – Tuesday 8:30-11:30 (but we start at 9), CNH307
Contact Information -
Hendrik Poinar (CNH 537) email: poinarh@mcmaster.ca
Office Hours: Mondays 11:30 – 1pm of by appointment.

Chemical and molecular analysis of archaeological material and human skeletal remains is now a standard component of research in biological anthropology and archaeology. This course is designed to introduce graduate students to the use of biochemical methods in these research streams, thereby providing them with intensive theory for lab-based training in the various methods. This course is designed for biologists, chemists, biological anthropologists and archaeologists who plan to use or critically review biochemical techniques in/for their own research agendas.

The course (744) will focus on an overview of theory and methods in bone chemistry and biomolecular analysis. Students will complete background research on a specific topic and will develop a research proposal for a lab-based project. Students will present their proposals at the end of Term for peer-review by their colleagues in the course.

We will work together in the first class meeting to set the direction of the course and to choose the topics to be considered. This schedule may be modified through group consensus as our interests broaden through exposure to the literature and to new ideas.

For our second seminar, please prepare an "intellectual autobiography" (~2 pages). You should write about who you are (both personally and/or professionally), your background, what experiences have shaped your academic interests, and why you are taking this course (other than Dr. Poinar or someone else in the Department told you to do so..). Please also provide at minimum TWO - potential topics or questions that are of interest to you or relevant to the research you will be pursuing here while at McMaster University. We will share these during the first seminar and use them to help identify topics for the course.

Seminar Goals -
- Understand the application of biochemical techniques in biological anthropology, and archaeology.
- Learn how these data are used to investigate broader archaeological and paleobiological questions.
- Recognize the strengths and weaknesses of the various biochemical techniques.
- Evaluate which techniques are most appropriate for the questions being considered.
- Understand how samples should be collected, stored, prepared, and analyzed.
- Critically review current literature on the topics of interest.

Recommended Texts* –

*A list of **required** readings will be assigned each week. Students are responsible for all required readings and are expected to be prepared to critically discuss theses readings in class.

Crawford M. 2007. Anthropological Genetics: Theory, Methods, and Applications. Cambridge University Press.

Shapiro B and Hofreiter M. 2011. Ancient DNA methodology. Humana Press Inc.

Price TD and Burton JH. 2010. An Introduction to Archaeological Chemistry. Springer.

Course Evaluation –

40% - Research proposal – you will be preparing and disseminating three works, that demarcate the progress from outline to finished product.

Outline of research – (10%).
Preliminary draft (10%) – drafts will be distributed to seminar participants for feedback
Final proposal (20%) in SSHRC/NSERC format, including budget and timeline (the whole shebang).

30% - Presentations of research proposal – you will be presenting 3 times over the course of the class on your proposal as it works itself towards a final, polished product. Each of these 15 minute presentations will be worth 10%. You will be expected to defend your work.

20% - One pagers. These are single page reviews of one of the papers we are reviewing per week, prior to the in class discussion.

10% Participation - Class participation is **mandatory**. You are expected to attend, ask questions, contribute to a critical evaluation of the assigned readings, bring your perspective to discussions, and raise issues from your own ongoing research. The degree to which each participant is enriched by this class relates directly to the degree to which all of us share information and ideas. You will also be required to productive detailed, constructive feedback on the preliminary drafts of your colleagues' research proposals.

List of potential topics covered in the course –
The degradation, preservation and retrieval of ancient DNA
The use of chemical techniques in Anthropology/Archeology/Paleontology
Ethics and current debates in archaeological science
Introduction to some of our lab facilities and lab safety

Identifying and comprehending diagenesis
Distinguishing between diagenesis and human alteration
Preservation of biomolecules – criteria for authenticity
Degradation of biomolecules
Paleogenomics and evolutionary genetics
Genetics and disease; paleopathogens
Modern human origins and the Neanderthal/Denisovan debate
Stable isotopes – migration and mobility
Stable isotopes – palaeodietary studies
Proteins in bone, teeth, hair, nails, etc…
Biomolecular analysis of diet (coprolites, etc...)
Forensic isotopes
Source of DNA
Fishing for DNA in complex metagenomic backgrounds
Problems and pitfalls in radiocarbon dating

EMAIL ME ASAP – SO I CAN PASS AROUND KEY PAPERS!

ACADEMIC DISHONESTY

Academic dishonesty consists of misrepresentation by deception or by other fraudulent means and can result in serious consequences, e.g., the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university.

It is your responsibility to understand what constitutes academic dishonesty. For information on the various kinds of academic dishonesty please refer to the Academic Integrity Policy, Appendix 3, www.mcmaster.ca/senate/academic/ac integrity.htm

The following illustrates only three forms of academic dishonesty:

1. Plagiarism, e.g., the submission of work that is not one's own for which other credit has been obtained. *(Insert specific course information, e.g., style guide)*
2. Improper collaboration in group work. *(Insert specific course information)*
3. Copying or using unauthorized aids in tests and examinations.

(If applicable) In this course we will be using a software package designed to reveal plagiarism. Students will be required to submit their work electronically and in hard copy so that it can be checked for academic dishonesty.

FACULTY OF SOCIAL SCIENCES
E-MAIL COMMUNICATION POLICY

Effective September 1, 2010, it is the policy of the Faculty of Social Sciences that all e-mail communication sent from students to instructors (including TAs), and from students to staff, must originate from the student's own McMaster University e-mail account. This policy protects confidentiality and confirms the identity of the student. It is the student's responsibility to ensure that communication is sent to the university from a McMaster account. If an instructor becomes aware that a communication has come from an alternate address, the instructor may not reply at his or her discretion.

Email Forwarding in MUGSI:
http://www.mcmaster.ca/uts/support/email/emailforward.html
*Forwarding will take effect 24-hours after students complete the process at the above link

(Approved at the Faculty of Social Sciences meeting on Tues. May 25, 2010)