



**Department of Anthropology**  
**Analytical Techniques in Archaeology and Biological Anthropology**  
**Anthropology 4424F**  
**Anthropology 9104A**

**Fall 2019-2020**  
**Instructor: Dr. Andrew Nelson**

**Class time:** Wednesday 1:30-4:30pm  
**Classroom:** SSC-2257

**Instructor:** Dr. Andrew Nelson  
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**Office:** Social Science Centre 3410

**Office Hours:** Tuesday 1:00-2:00pm and Wednesday 10:00-11:00am  
or by appointment

**Phone:** 519-661-2111 x85101

**Credit Value:** 0.5 credit

**Course Description:** This course explores how analytical techniques are applied in archaeology and bioanthropology. The focus is not on any specific analytical technique per se. Rather, the course focuses on the theoretical context and paradigm within which techniques are applied and results interpreted and the broad anthropological questions that they can address.

**Prerequisites for Anth 4424F:** Registration in fourth year in Anthropology and permission of the instructor. Completion of Anthropology 3308 F/G and/or 3311 F/G and a minimum grade average of 80% in 2200-level and higher Anthropology courses are recommended.

**Antirequisites:** None

**Course Syllabus:** Archaeology and Bioanthropology are two subdisciplines of anthropology that bridge the social and natural sciences. As such, they are inherently interdisciplinary. Often the research questions will arise from the social science side, but the methods utilized to address those questions are borrowed from the natural sciences. In the first half of the course we will explore what it means to work in the interdisciplinary realm, including defining *interdisciplinarity* and exploring the factors that encourage and/or discourage interdisciplinary research. We will also explore the nature of collaboration, including issues of intellectual property. In the second half of the course we will examine broad questions of archaeological & bioanthropological interest in terms of what analytical techniques can be deployed to answer those questions.

This is a seminar course open to a limited number of senior undergraduate students. Weekly meetings will include student presentations, class discussion, and occasional instructor lectures. Class participation is mandatory. The critical evaluation of the literature will be emphasized.

Course assignments will include semi-structured interviews of successful interdisciplinary scholars across campus and presentation and write a paper on one of the research areas outlined for the second half of the course, and an analytical technique that can be used to address that area.

### **Learning outcomes:**

By the end of the course you should be able to:

- place your research interests into the broad realms of archaeology and biological anthropology
- interact with scholars in other fields as part of an interdisciplinary research program
- work with your peers in a collaborative framework
- understand the principles of a range of analytical techniques and identify how those techniques can be useful to your research
- critically evaluate how analytical techniques are applied in the fields of archaeology and bioanthropology

### **Evaluation for Anthropology 4424F & 9104A**

Weekly reflection papers – 20%

Assignment #1 – interdisciplinary research interview – due and presented in week 6 – 20%

Assignment #2 – present and write a research paper on an analytical technique of choice – 40%

Participation – 20%

Details of the Assignments:

- Weekly assignments – read the assigned reading for the week and contribute 1 (for 4424F students) or 2 (for 9104A students) additional paper(s) and write a 500 word reflection paper on that material (and as many of the other contributed readings as you can). What is the key point of the readings? How are they relevant to you and the week's theme? Bring the paper to class and be prepared to present your paper to the class and to discuss the papers provided as well as the papers brought by the other students.
- Assignment #1 - Go and talk to a researcher who works in the interdisciplinary context. Discuss what works and what doesn't. What are the benefits of working in the interdisciplinary context vs the disadvantages? Are they multi- inter- or transdisciplinary (see the Choi & Pak 2006 paper)? Distill out the dos and don'ts of interdisciplinary research.

During the seminar on Interdisciplinarity, we will develop a basic questionnaire that everyone will follow so that each interview will have the same general themes. However, beyond that, the interviews are welcome to (and almost certainly will) diverge in quite different directions.

I will have some names to suggest as we approach this assignment.

- Assignment #2 - Pick an analytical technique that can address one of the topics for the weeks after the reading break. Consider the general topic and the basic science underlying the analytical technique and how it has previously been used in the archaeological/bioanthropological realm. Also consider how that technique has led to breakthroughs in archaeological or bioanthropological research. For instance, “how did the discovery of K-Ar dating shape the field of human evolution?”
  - This material will be presented as a 15-minute PowerPoint presentation in the last lecture and as a 3500 word paper for 4424F students and a 4500 word paper for 9104A students.
  - The paper is due December 11<sup>th</sup> for 4424F students and TBA for 9104A students.

*The essay will be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).*

Late Assignments: Extensions on assignments will only be given in the case of major medical or personal emergencies as first approved by the academic counselling office. Without an approved extension each day past due (including weekends) will result in the deduction of 5% off the grade for that assignment. Assignments more than five days late will not be accepted, and the student will receive a grade of zero for that assignment.

### **Western’s Academic Policies:**

All students should familiarize themselves with Western's current academic policies regarding accessibility, mental wellbeing, accommodation for medical illness, and plagiarism and scholastic offences. These policies are outlined with links to the full policies on the Anthropology Department web site – [click here](#).

## Weekly Discussion Topics and Example Readings

<u>Week/Date</u>	<u>General Topic</u>	<u>Specific Topics</u>	<u>Example Readings</u> (see below for full citations)
week 1 Sept 11, 2019	Archaeological Science/ Conservation- Technical Art History	Archaeological Science or Scientific Archaeology?	Hermens 2012; Martinón-Torres & Killick 2015
week 2 Sept 18, 2019	Interdisciplinarity		Choi & Pak 2006; Stahl et al. 2004 ; Ledford 2015
week 3 Sept 25, 2019	Collaboration / Intellectual Property		Nicholas & Bannister 2004; Bear Nichols 2017
week 4 Oct 2, 2019	Ethics	ethics of conservation ethics of authentication	Sease 1997; Clavir 2002
week 5 Oct 9, 2019	Assignment #1 discussion		
week 6 Oct 16, 2019	Imaging/visualization	CT/x-ray virtual representations	Llobera 2010; Cox 2015; Weber 2015
week 7 Oct 23, 2019	Reconstruction of the environment	paleoenvironment modern environment	Nicholl 2004 Koch et al. 2019
week 8 Oct 30, 2019	Reconstruction of life history variables	aging, sexing paleodemography	Cheverko & Hubbe 2017; Miller et al. 2018
week 9 Nov 6	reading week		
week 10 Nov 13, 2019	Reconstruction of health	paleopathology assessment of stress	Webb et al. 2010 ; van Schaik et al. 2019
week 11 Nov 20, 2019	Reconstruction of diet	isotopic analysis trace element analysis	Carter & Bradbury 2016; Turner & Livengood, 2016;
week 12 Nov 27, 2019	Reconstruction of chronology	absolute dating techniques, relative dating techniques	Pearce & Bonneau 2018; Roberts & Lian 2015
week 13 Dec 4, 2019	Assignment #2 discussion		

Readings:

Bear Nichols, A. 2017. Who owns Indigenous cultural and intellectual property? Policy Options Politiques <http://policyoptions.irpp.org/magazines/june-2017/who-owns-indigenous-cultural-and-intellectual-property/>

Carter, ML & Bradbury, MW. 2016. Oxygen isotope ratios in primate bone carbonate reflect amount of leaves and vertical stratification in the diet. American Journal of Primatology 78:1086–1097.

Cheverko, CM & Hubbe, M 2017. Comparisons of statistical techniques to assess age-related skeletal markers in bioarchaeology. American Journal of Physical Anthropology 163: 407-416.

Choi, BCK & Pak, AWP. 2006. Multidisciplinarity, interdisciplinarity and transdisciplinarity in health research, services, education and policy: 1. Definitions, objectives, and evidence of effectiveness. Clinical Investigative Medicine 29: 351-364.

Clavir, M. 2002. Preserving What is Valued: Museums, Conservation and First Nations (chapter 2 - Conservation values and ethics, pp: 26-66). UBC Press: Vancouver.

Cox, SL. 2015. A critical look at mummy CT scanning. Anatomical Record 298: 1099-1110.

Hemens, E. 2012. Technical art history: The synergy of art, conservation and science. In: M. Ramplay et al. eds., Art History and Visual Studies in Europe: Transnational Discourses and National Frameworks, Brill: London, pp: 151-165.

Llobera, M. 2011. Archaeological visualization: Towards an archaeological information science. Journal of Archaeological Method and Theory 18: 193-223.

Ledford, H. 2015. Team Science: Interdisciplinarity has become all the rage as scientists tackle society's biggest problems. Nature 525: 308-311.

Martinón Torres, M & Killick, D. 2015. Archaeological theories and archaeological sciences. In: A Gardner et al. eds., The Oxford Handbook of Archaeological Theory, Oxford Handbooks Online, Oxford University Press: Oxford, DOI: 10.1093/oxfordhb/9780199567942.013.004 f

Miller, GR, Wood, JW & Boldsen, JL. 2018. Paleodemography: Problems, progress, and potential. In: MA Katzenberg & A.L. Grauer eds., Biological Anthropology of the Human Skeleton, Third Edition. John Wiley & Sons, Hoboken, NJ, pp: 593-633. Ebook Central, <http://ebookcentral.proquest.com/lib/west/detail.action?docID=5494678>.

Nicholas, GP & Bannister, KP. 2004. Copywriting the past? Current Anthropology 45: 327-350.

Nicholl, K. 2004. Recent environmental change and prehistoric human activity in Egypt and Northern Sudan. Quaternary Science Reviews: 561-580.

Pearce, D.G. & Bonneau, A. 2028. Trouble on the dating scene. Nature Ecology and Evolution 2: 925-926.

Roberts, R.G. & Lian, O.B. 2015. Illuminating the past. Nature 520: 438-439.

Sease, C. 1997. Conservation and the antiquities trade. Journal of the American Institute for Conservation 36: 49-58.

Stahl, A et al. 2004. Writing for Many: interdisciplinary communication, constructionism, and the practices of writing. Historical Archaeology 38: 83–102.

Turner, BL & Livengood, SV 2016. Methods for reconstructing diet. In J. Chrzan & JA.Brett, eds., Food Research : Nutritional Anthropology and Archaeological Methods, Berghahn Books Inc: New York, pp: 159-181.

van Schaik, K, Eisenberg, R, Bekvalac, J, Glazer, A & Rühli, F. Evaluation of lesion burden in a bone-by-bone comparison of osteological and radiological methods of analysis. International Journal of Paleopathology 24: 171-174.

Weber, G.W. 2015. Virtual anthropology. Yearbook of Physical Anthropology 156: 22-42.

Webb, E., et al. 2010. Cortisol in archaeological hair as a biomarker for stress. Journal of Archaeological Science 37 (4): 807-812.