Advanced Morphometric Methods  
Anthropology 249.11

Course Instructors: Adam Gordon, Brian Richmond  
Spring 2005  
Class Time: Wed., 11-1  
Location: Rm 308, 2114 G St

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Rm 208, 2114 G St (Bldg BB)  
Office Hours: Wed., 2-4  
Office Hours: Wed 1:30-3:30

COURSE DESCRIPTION: A practical course in analytical methods with special focus on morphometric analysis, this course will address hypothesis development and testing, data collection issues (including pre- and post-data collection), variable construction and assessment, and various analytical techniques applied in physical anthropology. Techniques discussed will include analyses of quantitative genetics, allometric scaling, geometric morphometrics, phylogenetic comparative methods, and resampling methods. Particular emphasis will be placed on learning how to apply the last three topics to actual data sets. This course assumes students have some familiarity with basic statistics, regression techniques, and multivariate statistics.

COURSE MECHANICS: The first four class sessions will typically consist of a lecture followed by discussion of topics raised in the assigned readings. Questions will be provided to guide the students’ reading for these sessions. Later sessions will feature topics divided over two weeks. The first week will cover theory surrounding particular methods while the second week will feature application of the analytical method to real data sets. Pairs of students will be assigned to each of these later topics; these students will prepare questions for the rest of the class in advance of the class session. In general, students will be expected to discuss assigned readings each week as well as apply methods to their own data sets or to data provided for them. Because this course focuses on the practical application of analytical methods, over the course of the semester students are expected to develop an original research project, collect an appropriate data set, analyze the data, and present the results in a scientific conference format to the rest of the class at the end of the semester.

EVALUATION: Each student’s grade will be based on a written research project (40%), a 12-minute presentation of that project (30%), and class participation (30%). Class participation will include each student providing questions and leading discussion for one of the topics in the second half of the course. Research projects will consist of original data analyses designed to address specific research questions of interest to each student using appropriate data sets. Specifics regarding project topics and expectations for each student will be determined in consultation with the instructors.

ACADEMIC INTEGRITY: All graded work must be completed in accordance with The George Washington University Code of Academic Integrity, available online (http://www.gwu.edu/~ntegrity/code.html).
## COURSE SCHEDULE

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<td>Data and Analysis</td>
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<td>Geometric Morphometrics: Why and How?</td>
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<td>Apr 6</td>
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<td>Resampling Techniques: Why and How?</td>
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COURSE SCHEDULE & READINGS

Jan 19  Research Questions and Design
Readings:

Jan 26  Data and Analysis
Readings:

Feb 2  Quantitative Genetics
Readings:

Feb 9  Allometric Analyses
Readings:
  Godfrey LR & Sutherland MR (1996). Paradox of peramorphic paedomorphosis:
  Jungers WL, Falsetti AB & Wall CE (1995). Shape, relative size, and size adjustments in

Feb 16  Individual Project Consultations

Feb 23  Geometric Morphometrics: Why and How?
Readings:
  TBA

Mar 2  Geometric Morphometrics: Application
Readings:
  “How-to” manual.

Mar 9  Data Collection

Mar 16  SPRING BREAK
Mar 23  Phyllogenetic Methods: Why and How?
Readings:

Mar 30  Phyllogenetic Methods: Application
Readings:
   “How-to” manual.

Apr 6  AAPA Meetings in Milwaukee (NO CLASS)

Apr 13  Resampling Techniques: Why and How?
Readings:
   Howell DC (2001). Parametric and resampling statistics: two different philosophies of hypothesis testing – or is it three?
      http://www.uvm.edu/~dhowell/StatPages/Resampling/philosophy.html

Apr 20  Resampling Techniques: Application
Readings:
   Reno PL, et al. (2003). Sexual dimorphism in Australopithecus afarensis was similar to that of modern humans. PNAS 100:9404-9409.

Apr 27  Presentations