Anth 3118 Scientific Applications in Archaeology
Sept - Dec 2016

Instructor: Scott Hamilton  Lecture: Fri 8:30 to 10:30
Office Number: 343-8742  Lab: Fri 11:30 to 2:30
Lecture/Lab: BB-2002
Office: BB2001B

This course introduces scientific and technological applications, and analytic issues relevant to archaeology. This includes map construction and interpretation, the application of pedology and sedimentology interpreting archaeological sediments, geomorphology, site transformation, artifact typology and serriation, remote sensing, and understanding archaeological deposits in a regional and palaeo-environmental context. There is no assigned textbook, but there is an extensive reading list that students are expected to consult. PDF copies of the ‘powerpoint’ lectures will be available (D2L) for use as a study guide. You are encouraged to download, review and print them prior to each class.

Late assignments are strongly discouraged. If, however, your work is going to be unavoidably late contact me prior to due date. With acceptable explanations, extensions may be granted. Papers overdue more than 1 week (without an extension) will not be graded. Student’s performance will be evaluated as following:

- Lab exercises (5 exercises @ 10%)  50
- Mid term Test  20
- Take Home Exercise/Paper  30
  100

The lab exercises develop analytic skills useful for the final take home exam. The final exam will be distributed about 2 or 3 weeks prior to due date. This is a challenging assignment that takes thought and time. Do not delay starting it. You are encouraged to share ideas and debate strategies with classmates when doing the assignments. However, work will be graded individually. Put you individual perspective into these assignments. Plagiarism is readily identifiable and students with unduly similar/identical answers will be penalized.

Week 1 (Sept 9)
Introduction to GeoArchaeology
Archaeological sediments and its context
Geological Time Scales... terms and definitions
Problems with mapping.
  Lab: Using topographic and thematic maps
  Grid systems and their application.
  Lab Assignment 1

Week 2 (Sept 16)
Using mapping instruments (Compass, Plane Table, theodolite, laser level, total station)
Global Positioning Systems in archaeology.
  Lab 1 due (map reading) (10%)
Lab: Map interpretation cont’d
   Using optical surveying instruments
   Construction of topographic maps. (Lab assignment 2)

Week 3 (Sept 23)
Hamilton away… (class cancelled)
   Lab: work on Lab Assignment 2.

Week 4 (Sept 30)
Geomorphology and archaeology  Glacial/deglaciation deposition
   Fluvial deposition                  Lacusturine environments
   Aeolian deposition                 Volcanic deposition
   Cave studies
      Lab  Map instruments (outside demonstration)
      Lab assignment 2 due (topographic map construction) (10%)

Week 5 (Oct 7)
Archaeological context and association.
   Sediments and their nature           Sediment weathering
   Horizonation vs. development of organic soil
   Paleosols Types of ‘soil’
      Lab GPS instruments, issues of precision, resolution and scale
            GPS operation (outside exercise)

Fall Break (Oct 10 14) no class

Week 6 (Oct 21)
   Lecture: Mid Term Test (20 %)
      Lab Lithic technology, Artifacts, attributes, typology, serriation and artifact analysis

Week 7 (Oct 28)
Site Taphonomy, turbation and weathering
Site Structure, horizontal and vertical stratigraphy
      Lab Interpreting sedimentary profiles.
      Lab 3 due (artifact typology exercise) (10%)  

Week 8 (Nov 4)
The process of site discovery, sampling, probability statistics
Site investigations sequences
      Lab  Soil Chemistry interpretation

Week 9 (Nov 11)
Surface and subsurface remote sensing
      Lab 4 due Soil Chemistry exercise (10 %)
      Lab Geophysical Remote Sensing
Week 10 (Nov 18)
Surface and subsurface remote sensing cont’d
Paleo-environmental reconstruction
   Lab 5 due Proton Magnetometer assignment
   Lab  Take home exam distributed and discussed (30%).

Week 11 (Nov 25)
Introduction to Palynology
   Lab  UAV technology and Archaeology
   Questions regarding Take Home Exam

Week 12 (Dec 2)
Introduction to electronic cartography, graphics, and data presentation
Geographic Information Systems
   Take Home Exercise Due Dec 5 (30%)

List of Readings
Adovasio, J.M., J.D. Gunn, J. Donahue and R. Struckenrath
1978 “Meadowcroft rockshelter 1977: an overview”
American Antiquity 45:632-651.

Anderson, Duane C. and Homes A. Semken, Jr. (ed)
1980 The Cherokee Excavations: Holocene Ecology and
   Human Adaptations in Northwestern Iowa. Academic
   Press, New York.

Banning, E.B.
2002 Archaeological Survey Kluwer Academic/Plenum
   Publishers, New York

Bettis, E.A. III, and D.M. Thompson
1981 “Holocene Landscape Evolution in Western Iowa -
   Concepts, Methods and Implications for Archaeology” In
   Current Directions in Midwestern Archaeology edited
   by S.F. Anfinson, pp 1-14. Occasional Publications in
   Minnesota Anthropology No 9. Minnesota Archaeology
   Society, St. Paul.

Binford, L.R.
1981 Bones: Ancient Men and Modern Myths. Academic
   Press, New York.

Birkeland, P. W.

Butzer, K.W.
1971 Environment and Archaeology: An Ecological
   Approach to Prehistory Aldine Press, 2nd ed. Chicago.

1975 “The Ecological Approach to Archaeology: Are We

1982 Archaeology as Human Ecology. Cambridge
   University Press.

Birkeland, P. W.
1989 “The Influence of Flotation on the Rate of Recovery of
   Charcoal from Archaeological Sites” Journal of
   Ethnobiology 9: 207-227.

Brink, J.W.
1977 “Frost-Heaving and Archaeological Interpretation”

Bickham, T.J.
1989 “The Influence of Flotation on the Rate of Recovery of
   Charcoal from Archaeological Sites” Journal of
   Ethnobiology 9: 207-227.

Brink, J.W.
1979 Canadian Soil Survey Committee
1978 The Canadian System of Soil Classification
   Agriculture. Canada, Ottawa.

Carr, Christopher G.
1982 Handbook on Soil Resistivity Surveying Center for

Catt, J.A.
1986 Soils and Quaternary Geology: A Handbook for
   Field Scientists Oxford Science Publications, Monographs
   on Soil and Resources Survey 11, Oxford.

Courtney Marie A., Paul Goldberg and Richard Macphail
1989 Soils and Micromorphology in Archaeology
   Cambridge University Press, Cambridge


Davidson, D.A.
1982 Soils and Quaternary Geology: A Handbook for
   Field Scientists Oxford Science Publications, Monographs
   on Soil and Resources Survey 11, Oxford.


Davidson, D.A.


Mandel, Rolfe D. (editor) 2001 *Geoarchaeology in the Great Plains*, University of Oklahoma Press, Norman, Oklahoma


Rapp G. (Ripp) and Christopher L. Hill 1998 *Geoarchaeology: The Earth-Science Approach to Archaeological Interpretation* Yale University Press, New Haven


Stein, Julie K. and William R. Farrand (ed)
1985 Archaeological Sediments in Context. Peopling the Americas Edited Volume Series Vol 1 Centre for the Study of Early Man, Institute for Quaternary Studies, University of Maine at Orono.

Tamplin, M.J.

Trenhaile, A. S.

Turnbaugh, W.A.

Tuttle, S.D.

Villa, P.

Waters, Michael R.