

**ANTHROPOLOGY 402**  
**Archaeological Artifact Conservation**

Spring Semester 2016

Place: Anthropology Building, Rm. 101, Conservation Research Laboratory

Time: Tuesday and Thursday, 2:20- 5:00 PM

Instructor: Donny L. Hamilton

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Office Hours: 11:00 AM - 12:00 PM - Tuesday & Thursday, or by appointment

Anthropology Building, Room 102B

**COURSE DESCRIPTION:**

The analysis of the material culture recovered from any archaeological excavation which includes are the man-made artifacts of clay, stone, bone, shell, wood, leather, glass, ferrous metals, non-ferrous metals, and a host of atypical materials. Once excavated from an archaeological site, each object made from these materials are often in various states of deterioration or corrosion and each requires specific conservation techniques to stabilize them so that they can be studied and/or put on display in a museum. Proper conservation techniques are introduced in seminar/laboratory sessions designed to familiarize students with the chemicals, equipment, and procedures used in the treatments. Practical experience will be gained in treating wood, leather, various plant fibers, clay, stone, glass and the different metals commonly found in prehistoric and historic sites. To varying degrees, even ethnographic and historic artifact collections require conservation. The objective of this class is to train the student on how to properly conserve the majority of the artifacts commonly encounter in archaeological conservation. Prerequisites – Junior or senior classification or approval of instructor.

It must be remembered that the Conservation Research Laboratory (CRL) is a working laboratory. Therefore, all class and laboratory work is expected to be performed during the regularly scheduled class time on Tuesdays and Thursdays.

**LEARNING OUTCOME:**

This course trains students with the techniques of stabilizing and preserving deteriorated or corroded artifacts from archaeological sites - land sites and underwater sites.

Upon completing the course:

- Each student will be able to appraise the conservation problems associated with the different archaeological materials and determine what conservation procedures are capable of solving the varied problems.
- Each student will be qualified to plan out strategies to conserve the basic materials encountered in most archaeological sites
- Each student will know how to equip a basic conservation laboratory with the necessary equipment, chemicals, and expendables.

**Course Information:**

The latest version of the syllabus and various readings for the class is posted on-line on the class website. The links to the readings and conservation bibliography will be posted on the web and can be accessed by clicking on the links in the on-line syllabus.

**Basic textbooks and resources for the class are:**

Hamilton, Donny L., 2010. *Methods of Conserving Archaeological Material from Underwater Site*. On line conservation manual at: <http://nautarch.tamu.edu/CRL/conservationmanual/>

**Supplementary Readings:**

Cronyn, J. M. 1990. *The Elements of Archaeological Conservation*. London: Routledge.

Hamilton, L. Donny. 1976. *Conservation of Metal Objects from Underwater Sites: A Study in Methods*. Texas Memorial Museum, Austin, Texas.

Hamilton, L. Donny. 1997. *Basic Methods of Conserving Underwater Archaeological Material Culture*. Book prepared in partnership with the U.S. Department of Defense.

Additional journal and web site readings, other than those in the books listed above will be assigned on a weekly basis.

Other useful conservation links can be found at:

Conservation on Line -- <http://cool.conservation-us.org>

American Institute of Conservation:

<http://www.conservation-us.org/?fuseaction=Page.ViewPage&PageID>

English Heritage Guidelines

<http://www.english-heritage.org.uk/>

National Center for Preservation Technology and Training - <http://www.ncptt.nps.gov>

Periodic Table - Elements - <http://www.webelements.com/>

Historic England Publications – Search page - <http://historicengland.org.uk/images-books/publications/>

**Safety Information:**

Each student is to have the Laboratory Safety Agreement on file with the Anthropology Department office.

Though most students will fill it out as part of their registration, a copy of the agreement will be passed out on the first day class and discussed as part of the safety orientation.

Hard copies of most of the Material Safety Data Sheets (MSDS) for the chemicals used in the conservation laboratory are kept on file in Room 101A.

MATERIAL SAFETY DATA SHEETS (MSDS) FOR MATERIALS AND CHEMICALS

USED IN THIS LAB MAY BE ACCESSED ON ANY CRL COMPUTER or your smart phone AT:

<http://hazard.com/msds/> and <http://www.ilpi.com/msds/>

University of Akron - <http://www.healthandsafety.uakron.edu/cheminv/chkpasswd.asp>

Each student is expected to know how to access the MSD sheets.

**Class Information:**

Copies of all readings will be on reserve in the Nautical Archaeology Library and CRL. A CD with most of the assigned reading will be passed out on the first day of class.

## **BASIS FOR DETERMINING GRADE IN ANTH 402**

1. Class attendance, participation in class discussions and laboratory activities. Excessive absences (more than two un-excused absences) may result in a lower grade because of pop exams which cannot be made up.
2. Regular pop exams over assigned readings (5% of total grade).
3. Two scheduled exams (35% of total grade, 17.5% each exam)
4. A 2-3 page report will be prepared on resins, wood, ceramics, ferrous metals, and nonferrous metals - 40% of the grade.
5. Final Exam for 20% of grade

Each report will emphasize the student's own laboratory experiences as well as pertinent observations and comparisons garnered from lectures, published data and assigned readings.

Each report should be as succinct as possible. Reports are due the week following the completion of the topic. **All conserved artifacts (or material) used in the report are to be included with the report along with all the original conservation cards.**

Grading Scales:

A = 90-100 B = 80-89 C = 70-79 D = 60-69 F = <60

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### **Attendance Policy:**

"The University views class attendance as the responsibility of an individual student. Attendance is essential to complete the course successfully. University rules related to excused and unexcused absences are located on-line at <http://student-rules.tamu.edu/rule07>."

### **Plagiarism :**

The handouts used in this course are copyrighted. By "handouts," I mean all materials generated for this class, which include but are not limited to syllabi, quizzes, exams, lab problems, in class materials, review sheets, and additional problem sets. Because these materials are copyrighted, you do not have the right to copy the handouts, unless I expressly grant permission.

As commonly defined, plagiarism consists of passing off as one's own the ideas, words, writings, etc., which belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you should have the permission of that person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated.

If you have any questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules, under the section "Scholastic Dishonesty."

### **Americans with Disabilities Act (ADA) Policy Statement**

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit <http://disability.tamu.edu>"

For many years Aggies have followed a **Code of Honor**, which is stated in this very simple verse:

**"An Aggie does not lie, cheat, or steal or tolerate those who do."**

The Aggie Code of Honor is an effort to unify the aims of all Texas A&M men and women toward a high code of ethics and personal dignity. For most, living under this code will be no problem, as it asks nothing of a person that is beyond reason. It only calls for honesty and integrity, characteristics that Aggies have always exemplified. The Aggie Code of Honor functions as a symbol to all Aggies, promoting understanding and loyalty to truth and confidence in each other

## ANTH 402 COURSE SCHEDULE

Spring 2016\*\*\*\*\*SUBJECT TO REVISION\*\*\*\*\*

Most weeks the lecture will be held on Tuesday and the laboratory class on Thursday.

### **WEEK 1: (Jan 19, 22) - Introduction to laboratory, practices, equipment, safety.**

Jan 19, Laboratory Tour, filling out safety forms.

General Safety Index: <http://hazard.com/msds/> and <http://www.ilpi.com/msds/>

Manual FILE 1: Overview of conservation in archaeology; basic archaeological conservation procedures. <http://nautarch.tamu.edu/class/anth605/File1.htm>

UNESCO book, Chapter A. Basic equipment and processes by H.W.M. Hodges

Thurs: Mechanical Cleaning

### **WEEK 2: (Jan 26, 28) - Adhesives & Consolidants.**

Readings: Conservation Manual FILE 2: Adhesives and Consolidants

<http://nautarch.tamu.edu/class/anth605/File2.htm>

UNESCO, 1968 : Appendix: p. 305-331; Curt Moyer , The Duco Dialogues; Stephen Koob , Using Acryloid B-72 for the Repair of Archaeological Ceramics; SPNHC Leaflets , Vol. 1, No. 2; Adhesives and Consolidants in Geological and Paleontological Conservation: A Wall Chart.

Thurs. - Begin Adhesive-Consolidants lab. Make Paraloid Glue and mix consolidants.

### **WEEK 3: (Feb 2, 4) Bone & Ivory**

Readings: Cronyn ch. 6.4, pp. 238-245, pp. 275-284; and Bone Section in Conservation Manual FILE 3 <http://nautarch.tamu.edu/class/anth605/File3.htm>

Historic England Publications

<http://historicengland.org.uk/images-books/publications/animal-bones-and-archaeology/>

### **WEEK 4: (Feb 9, 11)- Wood**

Readings: Cronyn ch. 6, pp. 246-263; [CCI Journal on Wood](#) ; and Wood Section in Conservation Manual FILE 6 <http://nautarch.tamu.edu/class/anth605/File6.htm>

### **WEEK 5: (Feb 16, 18) – Silicone Oil and Freeze Drying Waterlogged Wood**

Readings: [Watson, 1982 , pp. 237-242](#); Conservation of Waterlogged Wood, National Museum of Denmark - <http://en.natmus.dk/historical-knowledge/research/research-projects/arco/>

English Heritage - waterlogged wood- on CD

<http://historicengland.org.uk/images-books/publications/waterlogged-wood/>

**WEEK 6: (Feb 23, 25) Leather**

Readings: Cronyn ch. 6, pp. 263-274; (P&W, Ch. I, Animal Skins and Skin Products); Omar, McCord & Daniels, The Conservation of bog bodies by freeze drying, in Studies in Conservation, V. 34, No. 3, pp. 101-109; and Leather Section in Conservation Manual.

FILE 7 <http://nautarch.tamu.edu/class/anth605/File7.htm>

WEB Pages:

Guidelines for the care of waterlogged archaeological leather

<http://www.eng-h.gov.uk/guidelines/leather.html>

**WEEK 7: (Mar 1, 3) -Textiles, Rope, & Misc. Organic Material**

Textile Section in Conservation Manual FILE 8

<http://nautarch.tamu.edu/class/anth605/File8.htm>

WEB Pages:

English Heritage - organic artifacts - on CD

<http://historicengland.org.uk/images-books/publications/waterlogged-organic-artefacts/>

APRL Reports

Silicone and Polymer Technologies: An Additional Tool in Conservation

<http://nautarch.tamu.edu/aprl/report01.pdf>

Silicone Oil: A New Technique for Preserving Waterlogged Rope

<http://nautarch.tamu.edu/aprl/report05.pdf>

**WEEK 8: (Mar 8, 10) - Glass, Pottery & Stone**

First Exam, Thursday, March 10<sup>th</sup>, 2016

Readings:

Ceramic and Glass Section in Conservation Manual FILE 4

<http://nautarch.tamu.edu/class/anth605/File4.htm>

and FILE 5 <http://nautarch.tamu.edu/class/anth605/File5.htm>

Historic England – Best Practice Publication.

<http://historicengland.org.uk/images-books/publications/archaeological-and-historic-pottery-production-sites/>

Olive & Pearson 1975 :63-68; Mibach 1975

**WEEK 9: SPRING BREAK MARCH 14th--18th**

**WEEK 10: (Mar 22, 24) Iron Conservation**

Iron Conservation Part I: Introduction and Equipment Sections in Conservation Manual. FILE 9--- <http://nautarch.tamu.edu/class/anth605/File9.htm>

FILE 10a--- <http://nautarch.tamu.edu/class/anth605/File10a.htm>

Thurs. - Start iron conservation: Mechanical, Chemical Cleaning

Readings:

English Heritage - x-radiography and metallurgy [http://www.english-](http://www.english-heritage.org.uk) on CD

<https://www.historicengland.org.uk/images-books/publications/x-radiography-of-archaeological-metalwork/>

Metallurgy – Best Practices.

<http://historicengland.org.uk/images-books/publications/archaeometallurgy-guidelines-best-practice/>

Archaeological Conservation

<https://www.historicengland.org.uk/advice/technical-advice/archaeological-science/archaeological-conservation/>

Archaeological Radiography

<https://www.historicengland.org.uk/images-books/publications/x-radiography-of-archaeological-metalwork/>

**WEEK 11: (Mar 29, 31) - Iron - Mechanical and Chemical Cleaning.**

Readings: Cronyn ch. 5.1, pp. 160-175 - Metal Conservation, and Cronyn 5.2 pp. 176-202- Iron, and Preliminary Steps Iron Section in Conservation Manual

<http://nautarch.tamu.edu/CRL/conservationmanual/File10a.htm>

Tannic Acid by Logan, CCI, 9/5

Conservation of Iron and their Consequences , National Museum of Denmark -

<http://www.natmus.dk/cons/x/metal/m1.htm6>

**WEEK 12: (Apr 5, 7) - Iron, Electrolytic Cleaning, continued**

Conservation manual, Iron Part II

<http://nautarch.tamu.edu/CRL/conservationmanual/File10b.htm>

Archaeological Metal Artifact Reduction/Cleaning by Electrolysis by Hamilton

Electrochemistry Encyclopedia,

<http://knowledge.electrochem.org/encycl/art-a04-archaeology.htm>

**WEEK 13: (Apr 12, 14) - Lead, Tin and Pewter**

Second Exam, April 12, 2016

Readings: Lead, Tin and Lead Alloys Section in Conservation Manual FILE 14

<http://nautarch.tamu.edu/class/anth605/File14.htm> ; Lane 1979 ;

On the treatment of pewter plates from the wreck of La Belle, 1686

by Worth Carlin and Donald H. Keith , IJNA, 26.1: 65-74.

**WEEK 14: (Apr 19, 21)- Copper, Bronze, Brass**

Readings: Metal Sections in Conservation Manual

FILE 11 <http://nautarch.tamu.edu/class/anth605/File11.htm>

FILE 12 <http://nautarch.tamu.edu/class/anth605/File12.htm>

Weisser , pp. 105-108; A bronze cannon from La Belle, 1686: its construction, conservation and display, by Donald H. Keith and Worth Carlin , IJNA, 26.2:144-158

**WEEK 15: (Apr 28, 30) - Silver and Gold; Composite Artifacts.**

Readings:

- Gold. Silver and Gold Sections in Conservation Manual

FILE 13 <http://nautarch.tamu.edu/class/anth605/File13.htm>

FILE 15 <http://nautarch.tamu.edu/class/anth605/File15.htm>

MacLeod & North 1979; Scott, 1983. See Readings CD

**Week 16: (May 3th)**

Review and clean laboratory

FINAL EXAM: Thursday, May 10, 2016, 1:00 – 3:00pm