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SCHOOL OF MATERIALS ENGINEERING

To: Engineering Curriculum Committee **EFD# 73-18**

FROM: David F. Bahr, Head School of Materials Engineering DB
DATE: March 4, 2019

Subject: Proposal for New Graduate Course

Contact for Information if questions arise: Name: Carol A. Handwerker
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Proposed Course Number:	MSE 58900
Course Title:	Archaeology and Materials
Short Title:	Archaeology and Materials
	Note: Course will be cross-listed with ANTH 589
Previously taught as:	MSE 59700: Sp10, Sp12, F13, F15, F17, F19
Course:	3 credit hour. 2 lectures / 1 lab session
Proposed offering:	Fall semester

Course Description: This course provides instruction in the methods and theories used by archaeologists and materials scientists to study ancient and historic technology. The course Will focus on the analysis and interpretation of archaeological artifacts and provide opportunities for hands-on learning.

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Material Science Engineering 597 / Anthropology 589

Archaeology and Materials Science - Syllabus

Instructors:

H. Kory Cooper, Assoc. Prof.
Department of Anthropology &
School of Materials Engineering
hkcooper@purdue.edu , 496-7430
Office Hours: Tuesday 2:30-3:30, or by appt.
322A

Carol Handwerker, Reinhardt Schuhmann Jr.
Professor of Materials Engineering
School of Materials Engineering
handwerker@purdue.edu, 494-0147
Office Hours: Thursday 12:30-1:20pm, or by STON Hall
appt. ARMS 2331

Lecture/Lab: Tuesday 8:30-10:10 (STON 154) and Tuesday & Thursday 1:30-2:20pm (ARMS 1021) – Unless otherwise indicated on the syllabus or communicated via email.

Catalog Description: This course provides instruction in the methods and theories used by archaeologists and materials scientists to study ancient and historic technology. The course will focus on the analysis and interpretation of archaeological artifacts and provide opportunities for hands-on learning.

Additional Course Information: Archaeology is the study of past cultures through an examination of the materials they left behind (artifacts and sites), which informs most directly on their technology. This course integrates the theoretical approaches used by archaeologists and other anthropologists to study technology with instruction in the use of modern technology used to analyze artifacts from archaeological and museum contexts. Materials science and engineering is the study of the relationships between composition, structure, processing and properties of materials with the intention of creating new materials and products for specific societal goals. Laboratory assignments will provide students with hands-experience in the analysis and interpretation of archaeological material and the processes that created them and will be augmented by demonstrations of manufacturing techniques and analytical equipment.

Prerequisite: Junior, senior, or graduate standing in Anthropology, Art and Design, Materials Engineering, Chemical Engineering, Chemistry, or permission of the instructor.

Course Reading Material:

Required

1. *People and Things: A Behavioral Approach to Material Culture*, (2009) James M. Skibo and Michael B. Schiffer. Springer. This book provides a theoretical and methodological framework useful for studying technology and technological change in any given context, ancient or modern. There will be some lecture and discussion based on this text, it may also be useful in developing your course research project/proposal. There is an e-copy in the Purdue Library but you may wish to obtain your own copy.
2. *he Science and Archaeology of Materials*. (2000) Julian Henderson. Routledge. This book provides a technical discussion of materials from an archaeological perspective and several case studies, mostly Old World. Portions of this book will be assigned; non-assigned parts may be of

use in developing your course research project/proposal. Two copies of this text will be put on reserve at the Engineering Library.

3. Journal articles and book chapters will be assigned throughout the semester on a variety of topics and posted on Blackboard as pdfs.
4. Specific chapters in Callister, William D. Jr. and David G. Rethwisch (any edition will do) *Materials Science and Engineering: An Introduction*. John Wiley & Sons. One copy will be put on reserve at the Engineering Library. Though not assigned, relevant chapters will be included in the list of weekly readings for those wanting some additional background on materials topics.
5. For non-Anthropology majors: Bahn, Paul (2000) *Archaeology: A Very Short Introduction*. Oxford University Press. Copies can be purchased online for under $10.00. If you have never taken an archaeology course this book provides a brief and enjoyable explanation of the discipline including major paradigms and current goals.

Course Grade Assessment and Assignment:

Grade Assessment	Pts.	%
Discussion Facilitation	8	2
Class Participation	24	6
Peer Review	16	4
Laboratory Assignments144	36	
Film Quizzes	32	8
Annotated bibliography 64	16	
Project/Proposal	72	18
Final Exam	40	10
Total	400	100

Discussion Facilitation – Throughout the semester class time will be devoted to discussing specific assigned readings. These discussions will be led by individual graduate students, or teams of undergraduates. These discussion leaders/teams will be responsible for initiating discussion of assigned readings through a combination of comments, questions, and/or use of relevant visuals and keeping the discussion flowing. A total of 25 minutes will be devoted to each discussion team/leader.

Class Participation - Your class participation score will be based on regular attendance and participation in discussion and labs throughout the semester.

Peer Review – You and your lab team, and where appropriate, your discussion team, will evaluate each other's performance and participation in group labs and discussion using forms we will provide.

Laboratory Assignments – There are 12 labs each worth 10 points (3%), 12x3% = 36% of your course grade. At the beginning of the semester you will be divided into teams of three for working on

laboratory assignments. Some labs consist of hands-on exercises analyzing artifacts (or sometimes replications) and other labs focus on demonstrations of relevant manufacturing processes or analytical instruments and require a write-up describing the demonstration, the operating principles behind a particular instrument, and the benefit of the demonstrated technique or instrument to the analysis of archaeological material. Attendance at all activities scheduled during lab time is mandatory. Lab 1 will be accomplished individually but for all other labs each team will turn in a single report, due the week following the lab assignment, unless instructed otherwise.

Film Quizzes – Links to films covering a variety of topics will be posted on BB. Accompanying each film will be 2-3 questions. Films will be viewed outside of class and answers to quiz questions submitted via BB, except or unless where noted otherwise on the syllabus. Each quiz is worth 4 points, 1%, for a total of 8% of your course grade. Film quizzes must be completed (online) by 5:00 pm Friday of the week they are assigned, unless otherwise noted on the syllabus.

Research Project/Proposal and Annotated Bibliography – Instead of a traditional research paper each student has the option to A) write a hybrid research paper/proposal, B) design and carry out an experiment appropriate for this course, or C) analyze available archaeological material and write up a report of findings. Tuesday of Week 4 we will discuss these options in class in detail, and go over funding agency guidelines and discuss the abstracts and published results of winning grants.

For all three options, you will submit via email to both professors your project/proposal idea by Thursday September 31st at 5:00 pm. Your final written report/proposal is due December 7th at 5:00 pm. A hard copy must be given to each professor. The grading breakdown is as follows. Initial submission of idea (3%), submission of ~15 page single-spaced document – 12% (format 5%, content 7%), brief in-class presentation of proposal/project 5%. Additional details and expectations for each of the three options will be provided on BB.

Final Exam – A take-home final worth 10% of your course grade will be assigned November 21st and due December 11th.

Anthropology Majors -Please remember to keep clean copies of all your written assignments for your anthropology portfolios. During your final semester, you will compile a portfolio of your significant written work in anthropology and from other courses, too, if you wish. The department's website provides further information about the portfolio requirement and exit interview.

Learning Outcomes:

1. archaeological approaches to the study of technology, and the role of materials science in archaeological research.
2. Demonstrate a nuanced understanding of, and appreciation for, ancient and contemporary technologies and the materials properties which led to their fabrication and use in specific ways.
3. Demonstrate the ability to write a research proposal, design educational material, or design and conduct a research experiment that incorporates materials science in the investigation of past (ancient, historic, or potentially more recent) technology.
4. Understand the relationship between Culture and Technology and communicate concepts about the impact of this relationship on the environment and issues of sustainability.
5. Generate critical questions about a set of journal articles focused on specific topics and lead the class in a systematic discussion of the articles and the questions they raise.

6. Select and discuss written information from journal articles, books, the class textbooks, and class lectures to produce a comprehensive picture of specific anthropology, archaeology, and materials science concepts and approaches to the study of materials and culture.
7. Compare and contrast the information that different materials characterization techniques can provide about the way historical artifacts were made and used, including the materials from which they are constructed.

General expectations: Attendance and keeping up with assigned readings are crucial for success in this course. Parts of some lectures will be made available as PDF documents on Blackboard. Please avoid the following during lecture because they are distracting to your fellow classmates and detract from the classroom environment: reading ANYTHING, e.g., the paper (including doing crossword puzzles), books (novels, textbooks, etc., even those for this course), and chatting with classmates. You may use a laptop computer to take notes but internet surfing is NOT allowed, neither is talking, texting, emailing, or checking your email or messages via any electronic device. Reading the course syllabus and staying registered in this class means you agree that the schedule, grading criteria, and rules regarding classroom behavior are appropriate.