

**ANTH2740/UGEB2505 [2021-2022]**  
**Deciphering the past: culture, archaeology and science**

Time: Thu 11:30-1:15 pm

Venue: NAH 115

Instructor: LAM, Wengcheong

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TA: Chen Yutong ([BeiYuchen@outlook.com](mailto:BeiYuchen@outlook.com))



**Course description**

How we understand the past defined the way how we understand our current situation. Although archaeology is a dynamic discipline that has tremendously expanded our knowledge about the past, this subject is not just about digging and doing fieldwork. A wide range of new techniques (e.g., metallurgy, GIS, zoology, and 3d stimulation) and methods, which transformed the understanding of ourselves and our culture in many ways, have been incorporated into recent archaeological research. This course provides a general introduction about basic archaeological science to demonstrate new technology change the research paradigm of human culture and history. Moreover, this course tries to cultivate students' cross-disciplinary research skills and prepare them for the arrival of new, digitalized research era. Although our department has also offered a 1000-level course in the curriculum, this course will focus more on mechanisms of new archaeological techniques and encourages students understand the implication and application of these techniques in a broader social context.

**Course objectives:**

Students taking this course can expect to:

- #1 Introducing “scientific reasoning”;
- #2 Introducing latest new techniques that are now widely employed in archaeological research;
- #3 Introducing the basic development of various human technology (e.g., metal) in order to explain how human history and technology in the past shaped this modern world.

**Learning outcomes:**

After taking this course, students are expected to:

- #1 Understand what is “scientific reasoning”, and be able to evaluate claims about the past by combining anthropological knowledge and understanding of scientific techniques;

#2 To understand how latest new technology can contribute to better understanding the history of human lives (e.g., the using of iron and bronze, the using of ceramic, and the changes of subsistence practice)

#3 To equip students, especially those in humanities (e.g., anthropology, history, and art history), the basic technical skills that can be applied in research relevant to archaeology, material culture, and cultural heritage;

#4 Inspire students of different backgrounds to employ new techniques addressing problems challenging most cultural heritage projects that our current society is encountering.

**Learning activities:** Two 45 min lectures and one 1-hour tutorial per week for one semester

**Medium of instruction:** Cantonese

### **Grade Descriptors**

#### **GRADE DESCRIPTORS**

<i>Grade</i>	<i>Criteria for 1) the course and 2) for coursework</i>
A	1) Outstanding performance on all learning outcomes.  2) The work has creatively synthesized course materials and key ideas in an original way. The argument is logical and cohesive, the discussion is well-organized, and the writing is clear. Concrete evidence corresponds to statements and claims.
A-	1) Generally outstanding performance on all (or almost all) learning outcomes.  2) The work synthesizes course materials and key ideas in an original way, but there are areas for improvement.
B-range	1) Substantial performance on all learning outcomes, OR high performance on some learning outcomes which compensates for less satisfactory performance on others, resulting in overall substantial performance.  2) The work demonstrates a solid grasp of course materials and key ideas. There are areas for improvement with respect to building a cohesive argument, organizing the discussion, communicating clearly, and/or identifying relevant evidence.
C-range	1) Satisfactory performance on the majority of learning outcomes, possibly with a few weaknesses.  2) The work shows some effort, but course materials have not been sufficiently engaged. The argument and the writing is not clear, and/or there is no evidence for statements and claims made.
D-range	1) Barely satisfactory performance on a number of learning outcomes.  2) The work shows little effort to engage course materials. There are major problems with clarity of argument and writing.
F	1) Unsatisfactory performance on a number of learning outcomes, OR failure to meet specified assessment requirements.  2) The work has failed respond to the assignment prompt.

### **Evaluation**

#1 Attendance and tutorial participation 20%

#2 Mid-term (reflection paper on 宋皇臺 exhibition) 25%

#3 Group project [Oral presentation] 20%

#4 Final paper 35%

### **Week 1: Introduction (September 9)**

*What is the archaeological science and archaeological way of the thinking?*

No reading for this week

### **Week 2: Can we study aliens in the past? (September 16)**

*What is the philosophy of science and pseudoarchaeology?*

### **Reading:**

吳國盛

2002 科學的歷程. 北京：北京大學出版社，13-16 頁，233-240 頁。

Feder, Kenneth

2013 *Frauds, Myths, and Mysteries: Science and Pseudoscience in Archaeology*. McGraw-Hill Education. (read p.18-46)

For critical reading: please check

Daniken, Erich von

2013 *Remnants of the Gods: A Visual Tour of Alien Influence in Egypt, Spain, France, Turkey, and Italy*. New Page Books.

### **Week 3: Truth and fallacies in numbers (September 23)**

*An introduction to quantification research and sampling in archaeology*

#### **Reading:**

中國社會科學院研究所編

2012 科技考古的方法與應用. 北京：文物出版社，26-36 頁.

\* (For students who are not familiar with basic statistics, such as mean, average, standard deviation, etc.)

Drennan, Robert D.

2009 *Statistics for Archaeologists: A Common Sense Approach (Second Edition)*. Second ed. Springer, New York. (Chapter 1)

### **Week 4: Deciphering the secret of our meat (September 30)**

*A basic introduction to zooarchaeology*

#### **Reading:**

袁靖

2007 動物考古學揭密古代人類和動物的相互關係. 西部考古, 2007 年.

羅運兵

2013 “與豬同行” 中國古代豬類的馴化與飼養. 大眾考古, 2013年第10期.

Further reading:

袁靖

2018 中國科技考古討論. 上海：復旦大學出版社，118-133 頁.

### **Week 5: Deciphering the secret of our staple food (October 7)**

*A basic introduction on archaeobotany*

#### **Reading:**

侯亮亮

2017 麵食在山西的前世今生, 大眾考古, 2017年第8期, 48-51頁.

趙志軍, 貝雲

2010 小麥：秦統一天下的力量, 中華遺產, 2010 年第 1 期, 122-137 頁.

Further reading:

中國社會科學院研究所編

2012 科技考古的方法與應用. 北京：文物出版社，90-127 頁.

**Week 6: Chung Yeung Festival (No class)! (October 14)**

**Week 7: Deciphering the secret of ancient landscape and environment (October 21)**

*A basic introduction on ancient environmental study, spatial technology, and 3d stimulation*

**Reading:**

Spying on the Past: Declassified Satellite Images and Archaeology (on-line exhibition, visit <https://www.peabody.harvard.edu/node/2147>)

劉建國

2016 可移動文物的多視角影像三維重建. 考古, 2016年第2期, 97-103頁.

Further reading:

袁靖

2018 中國科技考古討論. 上海: 復旦大學出版社, 80-98頁.

**\*due-date of the mid-term report**

**Week 8: Deciphering the microscopic world (human body and artifacts) (October 28)**

*A basic introduction on chemical analytical methods (stable isotopic analysis), DNA analysis, and microscopic techniques*

**Reading:**

侯亮亮

2017 從“我即我食”到“人如其豬(狗)”. 大眾考古, 2017年第5期, 36-40頁.

Madeline Sofia

2016 5,000-Year-Old Chinese Beer Recipe Revealed. *National Geography*

<https://www.npr.org/sections/thesalt/2016/05/23/479186257/5-000-year-old-chinese-beer-recipe-revealed>,

Further reading:

袁靖

2018 中國科技考古討論. 上海: 復旦大學出版社, 55-66頁.

**Week 10: Deciphering the secrets of ancient ceramics (November 4)**

A basic introduction on the manufacturing techniques and relevant research of ceramics

**Reading:**

郭夢

2013 操作鏈理論與陶器製作技術研究, 考古, 2013年第4期, 96-104頁.

**Further reading:**

Rice, Prudence M.

2007 Pottery and Its History. In *Reading Archaeology: An Introduction*. R.J. Muckle, ed: Broadview Press, p.174-187.

**Week 10: Deciphering the ancient industrial world (November 11)**

*A basic introduction on ancient mints and chaine-operatoire of artifacts*

**Reading:**

陳建立

2014 中國古代金屬冶鑄文明新探, 北京: 科學出版社 (第二章; 請集中閱讀 2-21 ; 31-43 , 相關檢測技術可以略讀)

**Further reading:**

Killick, David and Thomas Fenn

2012 Archaeometallurgy: The Study of Preindustrial Mining and Metallurgy. *Annual Review of Anthropology* 41(1):559-575.

**Week 11: Deciphering the secrets of ancient bronze (November 18)**

**Reading:**

Jianjun Mei, Pu Wang, Kunlong Chen et al..

2015 Archaeometallurgical studies in China: some recent developments and challenging issues. *Journal of Archaeological Science* 56: 221-232

Further reading:

中國社會科學院研究所編

2012 科技考古的方法與應用. 北京: 文物出版社, 172-194 頁.

**Week 12: Deciphering the secrets of ancient iron (and other metals) (November 25)**

**Reading:**

華覺明

1999 中國古代金屬技術-銅和鐵造就的文明. 鄭州: 大象出版社, 294-318 頁.

Further reading:

Han, Rubin, and Jianli Chen

2013 Casting iron in ancient China. In *The World of Iron*. J. Humphris and T. Rehren, eds. Pp. 168-177. London: Archetype publications.

**Week 13: Group-project presentation/ *basic introduction on techniques in cultural heritage conservation* (December 2)**

**Reading:**

Martinon-Torres, Marcos

2008 Why Should Archaeologists Take History and Science Seriously? In *Archaeology, History and Science: Integrating Approaches to Ancient Materials*, edited by M. Martínón-Torres and T. Rehren, pp. 15-36. Left Coast Press, Walnut Creek.

Watch the clip before coming to the lecture: 我在故宮修文物: 青銅器篇

([http://www.iqiyi.com/v\\_19rr177dq4.html](http://www.iqiyi.com/v_19rr177dq4.html))

Tutorial:

Week 1

No tutorial

Week 2: Fieldtrip: Sacred Hill exhibition

Week 3: Practice of statistic analysis

Week 4: Animal bone identification

Week 5: Practice of flotation and plant identification

Week 6: No tutorial

Week 7: 3d simulation

Week 8: Microscope and microware analysis

Week 9: Basic petrography and ceramic analysis

Week 10: Pxf and understanding ore

Week 11: Metallurgical analysis

Week 12: No tutorial:

Week 13: No tutorial: for group project presentation