



# ARCHAEOMETALLURGY SEMINAR

ANTH 5252, AAMW 5552, CLST 7314, NELC 6950

UNIVERSITY OF PENNSYLVANIA  
SPRING 2024

## Course Description

This course is designed to provide an in-depth analysis of archaeological metals. Topics to be discussed include: the exploitation of ore and its transformation to metal in ancient times, distribution of metal as a raw material, provenance studies, development and organization of early metallurgy, and interdisciplinary investigations of metals and related production artifacts like slag and crucibles. Students will become familiar with the full spectrum of analytical procedures, ranging from excavation techniques to microscopy for materials characterization and mass spectrometry for geochemical fingerprinting. Each student will undertake an individual research projects analyzing archaeological objects using the analytical methodology of archaeometallurgy will be developed throughout the semester.

## Approaches

We will investigate the history and development of metal artifact production and its societal significance using case studies from around the globe. Students will discuss scientific articles that address the application of analytical techniques to ancient mining, metalworking, and artifacts to explore metal use in past cultures. Hands-on and experiential components include data collection using common methods employed in archaeometallurgy, visits to relevant analytical equipment available on Penn's campus, and a visit to a metal workshop in the area. There is also potential for lab-based experimental work based on technological reconstruction.

This semester students will have the opportunity to learn from and participate in the documentation and analysis of copper-based artifacts from the 4<sup>th</sup> to 2<sup>nd</sup> millennium BCE Tepe Gawra (Iraq), tracing early developments in copper and bronze technologies in the Near East. Students have the option to work on this assemblage or one of their choosing for the final research project.

**FRI 8:30–11:30 AM**

Penn Museum  
CAAM Classroom  
MUSE 190

## INSTRUCTOR

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Philadelphia, PA

## *Key Topics & Methods*

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- Interactions between humans & metals
- Extractive Metallurgy
- Geology of Ores & Mining Technologies
- Environmental Impact
- Technical Ceramics (crucibles, molds, furnace structures)
- Excavation Techniques & Sampling Methodology
- Metallography & Microscopy
- Chemical Analysis
- Provenance Studies & Isotopic Analysis
- Experimental Archaeology

## **Grading & Assignments**

Attendance is required for class lectures. Absences must be submitted through Penn's Course Notification system prior to the absence (no exceptions).

Assigned weekly readings should be read in advance of each class, to be able to follow and actively contribute to the discussion.

The following work will form the basis for grade evaluation:

1. 2 written discussions on a chosen subject, including content from course readings, lectures, and in-class discussions, with short bibliography (3 pages), 20%
2. Laboratory coursework throughout the semester, 20%
3. Student lead presentation on a cutting-edge research method in the field (15 mins), 15%
4. Participation and attendance, 15 %
5. Final Research Project, 30%

\*Project topics are open to students' interests and should be discussed early in the semester.

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