



An Introduction to Paleoradiography

Course specifications for employers and institutions

Overview:

This is a four-hour asynchronous online course aiming to introduce the use of radiography (x-rays) in archaeology. It is a broad overview of research potential and application in academic or commercial archaeology. The primary focus is upon radiographic science, explaining the factors related to image generation, interpretation and limitations of x-ray imaging. Participants who have specific interests in paleopathology, zooarchaeology or metalwork conservation are provided with additional recommended literature.

This course has been approved as Continual Professional Development by the Chartered Institute of Archaeologists (United Kingdom) and the Register of Professional Archaeologists (USA). The learning outcomes have been mapped to national occupational standards and four hours of CPD can be recorded towards CPD requirements for accredited archaeologists. The design and content of this course is based upon research investigating the online learning preferences for undergraduate archaeology students. The published article can be located on the [Journal of Archaeology and Education](#) website.

Participants will have access to the course webpages for six months with no expectation to attend timetabled events. The course is split into four sections, each requiring approximately one hour to complete. The learning content includes on-screen text, diagrams, radiographs, photographs, videos and academic literature (journal articles). There are quizzes at the end of each section to test the participant, although these are not mandatory. Upon completion of the course the participants will be sent a certificate. The course encourages feedback and communication between the tutor and student to identify problems, update or amend content or suggest useful literature for future students.

Course fee:

The fee for access to the course and a certificate of completion is £50.00 British Pounds and can be purchased on the paleoimaging.com website. Please contact James Elliott to discuss discounts for group access.

Author credentials:

James Elliott holds undergraduate degrees in both archaeology and diagnostic radiography, along with a Masters in Forensic Radiography and a teaching qualification. He has worked across the south east of England as a radiographer for the last 13 years and within academia as a lecturer for the past four years at Canterbury Christ Church University. Since joining the university he has collaborated with the archaeology department and Canterbury Archaeological Trust for teaching and research. His most recent publication '*Radiography of human dry bone: A reflective account with recommendations for practice*' explores the application of radiography with archaeological remains. He continues to research, write and explore the use of radiography within archaeology.

Course structure:

- **Part 1 - Core concepts**
 - What are x-rays?
 - What is radiography?
 - How are x-rays used in archaeology?
- **Part 2 - Image brightness and contrast**
 - How are x-rays made?
 - Object density and image grayscale
 - Photodensitometry
- **Part 3 - Radiographic technique**
 - What is radiographic technique?
 - Geometric unsharpness
 - Radiogrammetry
- **Part 4 - Paleoradiography in research**
 - Using DICOM files
 - Data extraction
 - Related technologies

Fundamental paleoradiographic theory:

The following concepts are explored during this course

1. Radiographs as two-dimensional representations of a three-dimensional objects.
2. The relationship between specimen density and grayscale upon the radiograph.
3. The effect of geometric unsharpness upon image quality.
4. The utility of radiographs as a source of quantitative analysis.

National Occupational Standards:

The following standards have been identified as being applicable to the course.

An introduction to paleoradiography short online course supports the knowledge requirements for

AC1 Research and analyse information to achieve objectives

K2 what the research aims of the project are

K3 the sources of information relevant to the research

K6 how to obtain different types of information

K10 how different types of information relate to the research aims

K12 the research aims

K13 which types of analysis method are appropriate

<https://www.ukstandards.org.uk/PublishedNos-old/CCSAPAC1.pdf>

AC2 Conduct non-intrusive investigations

- K1 how to verify the aims and goals of the project
- K6 how to brief personnel on investigation methods
- K8 the relevant technical and ethical standards applicable to the work
- K9 the different types and modes of investigation
- K12 the types of equipment which may be required
- K13 the types of facilities required
- K15 how to conduct investigations
- K19 how to adapt investigation procedures and practices to suit different conditions
- K22 types and modes of investigation
- K23 circumstances and conditions which can affect investigation operations
- K29 how to advise users on the interpretation of investigation
- K30 the different types of investigation data
- K31 the limitations of techniques and data
- K32 the different types of data analysis

<https://www.ukstandards.org.uk/PublishedNos-old/CCSAPAC2.pdf>

AC8 Undertake analysis and interpretation of archaeological material and data

- K1 How to carry out analysis and interpretation
- K3 Relevant technical and ethical standards
- K4 Types of analysis and interpretation
- K5 Types of method
- K6 How to conduct analysis and interpretation
- K9 How to adapt analysis and interpretation procedures and practices to suit different conditions
- K11 Types and modes of analysis and interpretation
- K12 Circumstances and conditions which can affect analysis and interpretation activities

<https://www.ukstandards.org.uk/PublishedNos-old/CCSAPAC8.pdf>

Course version log:

January 2023 – Due for update following course feedback

January 2022 – Updated following archaeological practitioner feedback

September 2021 – Revised following participant feedback*

July 2021 – Revised following participant feedback*

April 2021 – Created*

* Teaching Paleoradiography Theory Using E-learning – A Participatory Action Research Study with Undergraduate Archaeology Students. *Journal of Archaeology and Education*

<https://digitalcommons.library.umaine.edu/jae/vol6/iss1/1/>