



INSTITUTE OF ARCHAEOLOGY



MSc ARCHAEOLOGICAL SCIENCE: TECHNOLOGY AND MATERIALS

Degree Handbook 2023/2024

Co-ordinator:

Miljana Radivojević

m.radivojevic@ucl.ac.uk

Office hours book [here](#)

Introduction

This is the Handbook for the MSc degree programme in *Archaeological Science: Technology and Materials*. It outlines the aims and objectives, structure and content of the degree, and includes summaries of the most relevant options available this year. The information given here, and much more, is also available on the Institute's website.

This Handbook should be used alongside the MA/MSc Handbook (also available online), which contains information about all MA and MSc degrees (and options within them) being taught this year. Students should consult that Handbook if they need information about an option outside those normally offered within the present programme. The MA/MSc Handbook gives essential information on a range of topics, including enrolment, guidelines on referencing and plagiarism, and guidance on coursework and the dissertation. Students should ensure that they read it carefully. Distributed along with the MA/MSc Handbook are maps of the College precinct and surrounding area of London, the complete MA/MSc teaching timetable and the list of Personal Tutors to MA and MSc students.

All taught graduate programmes are designed for students who already have a relevant degree at undergraduate level, or suitable prior experience. Given the interdisciplinary nature of this degree, however, we understand that many students may be weaker in certain areas. If you feel less confident about some of the topics covered, please ask for help. We will provide personalised guidance for readings, data analysis, and any aspect of the degree.

If students have queries about the organisation, objectives, structure, content or assessment of the degree, they should contact the Degree Co-ordinator, who will be pleased to discuss your concerns and answer any questions you may have.

What is the degree about?

This degree is focused on artefacts and how scientific techniques can be used to understand their technologies and origins. This information may then be used to address questions about the human past, for example technological transfer, trade and exchange, invention, innovation, social organisation and many more.

Combining class-based introductions with extensive practical sessions in the laboratory, it aims to introduce students to the necessary research skills to design, implement and report instrumental analyses of archaeological materials. The degree has a focus on inorganic materials – ceramics, metals, glass, and stone – which are those most commonly recovered from archaeological excavations. However, discussions will cover organic material, too. The instrumental and research skills acquired by students are transferable to other archaeological, environmental, and conservation materials.

The degree includes practical training in sample preparation for petrography, metallography, chemical and isotopic analyses, as well as use of optical microscopy, SEM-EDS, pXRF, Tandem LA/LIBS-ICP-MS, and XRD, in addition to critical engagement with several other techniques.

While all students in this degree are expected to become competent in laboratory-based analyses, they should also obtain training on anthropological approaches to science-based archaeology and/or computing and data science, as well as choosing from a range of option modules on specific materials, methods, regions and periods.

Who is the degree for?

The degree is designed to allow students to cross over from humanities, social science, or physical science backgrounds into laboratory-based archaeology. No one background is preferred. We tailor our training to build on and expand individual student strengths, while fostering a communal environment that encourages students to learn from each other.

If you have an **archaeology degree** you will receive user-friendly training in materials science principles and methods directly related to the analysis of archaeological materials. You will experience a wide range of laboratory work.

If you have a **science degree** you will be able to apply your scientific knowledge to the investigation of archaeological materials, with a context provided by material-specific modules which provide the appropriate archaeological background.

If you have a **conservation degree** you will learn the research skills and techniques needed to understand the technologies and materials of the objects that you conserve.

The degree provides an excellent background in the research skills needed to undertake a **PhD in Archaeological Science**.

Aims, objectives and outcomes of the degree

The *MSc Archaeological Science: Technology and Materials* aims:

- To provide a wide-ranging and challenging introduction to the theoretical issues involved in materials analysis as a means of investigating archaeological problems.
- To encourage critically aware perspectives on scientific practice and research processes in archaeological science, and their role in contributing to the development of knowledge and theory in archaeology.
- To provide an in-depth understanding of approaches to the analysis and interpretation of materials in the context of archaeological research.
- To provide a sufficiently detailed understanding of materials science approaches to archaeological finds to serve as a basis for independent research.
- To foster the ability to develop original research questions and to explore them effectively through materials analysis.
- To provide training relevant to a professional and/or research career in the materials aspects of archaeological science.

These aims are pursued through a degree programme with a core module designed to provide a solid understanding of the foundations, approaches, potentials, and challenges of artefact and materials analysis in archaeology. A range of options relevant to artefact and materials analysis, archaeological theory, and computation, encourage students to define individual pathways through the programme. Students should tailor the programme to fit their specific interests and personal educational objectives. **All students undertake a supervised research project leading to a 15,000 word dissertation**, which enables them to develop specific practical, analytical, and interpretive skills, in addition to broader research skills.

Objectives: Upon successful completion of the degree students will, among other things, have:

- Gained a detailed understanding of recent theoretical and practical perspectives in materials analysis in archaeological science.
- Developed their critical faculties in discussion, debate, and evaluation of alternative interpretations and perspectives on artefactual and materials data.
- Carried through a substantial programme of independent research embodied in a dissertation on a topic involving archaeological materials analysis that demonstrates theoretical understanding and practical competence in science-based archaeological analysis and interpretation.

Outcomes: More generally, they will also have:

- Developed a critical awareness of the relationships between materials, culture, and society.
- Acquired a range of practical skills (laboratory, instrumental, and quantitative), relevant to their further development.
- Developed a range of generic research-oriented and team-working skills.

Programme structure

The programme of study for this degree is intended to help students meet the objectives outlined above, and also to provide an opportunity for them to achieve any additional personal objectives. To fulfil the requirements of the degree you study 180 credits.

Core module

Students all follow one core module:

- Laboratory and Instrumental Skills in Archaeological Science (ARCL0170, 15 credits, 11 weeks)

Option modules

You are then able to choose further option modules to the value of 75 credits, depending on your background and interests. These options should be made up of:

a) At least 15 credits of the following:

- Technology within Society (ARCL0169, 15 credits, 11 weeks)
- Archaeological Data Science (ARCL0160, 15 credits, 11 weeks)

b) At least 30 credits of the following:

- Archaeometallurgy (ARCL0098, 15 credits, 11 weeks)
- Archaeological Ceramics Analysis (ARCLG114, 15 credits, 11 weeks)
- Interpreting Pottery (ARCL102, 15 credits, 11 weeks)
- Archaeological Glass and Glazes (ARCL0099, 15 credits, 11 weeks)
- Prehistoric Stone Artefact Analysis (ARCL0101, 15 credits, 11 weeks)
- Geoarchaeology: Methods and Concepts (ARCL0097, 15 credits, 11 weeks)
- Working with Artefacts and Assemblages (ARCL0171, 30 credits, 22 weeks)

c) The remaining 30 credits may also come from the above lists or can be chosen from the outstanding range of other Masters modules offered at the UCL Institute of Archaeology or elsewhere within UCL (subject to availability and resources).

Dissertation

The dissertation is equivalent of **90 credits** and therefore contributes 50% towards your final degree grade.

The dissertation of 15,000 words is a report on research, the topic chosen being approved as being relevant within the general area covered by this degree. Before Christmas, students should discuss their area of research interest with their Degree Co-ordinator, who will help them to focus their ideas for their dissertation or refer them to another member of staff who will be able to provide more specific advice and will probably be appointed to be the student's Dissertation Supervisor. They will help the student define their dissertation topic and provide guidance through the main stages of the work. The dissertation provides a further opportunity to define and achieve the student's own particular objectives and may be related to a fieldwork period. It should be used to apply newly learned approaches to an archaeological problem and to gain greater experience with particular methods of data generation and analysis. If a student is studying part-time while working in the field, they might choose to analyse a data set derived from their own work, or to assess the potential of particular theoretical or methodological approaches for their work. They can treat the dissertation as a one-off research project, as a pilot study for a PhD project, or use it to showcase their skills to potential employers.

The dissertation should be submitted by **2 September 2024**. Guidelines for researching, writing and producing the dissertation are included in the MA/MSc Handbook.

The aim of the dissertation is to produce a written report (illustrated and referenced as necessary) based upon individual research on some area of material analysis and interpretation. This could include assemblages from excavated contexts, literary sources, or archived material, but there must be a specific range of materials being discussed. In some cases, this will combine a professional finds report with an academic overview of the particular field using the results of the analysis undertaken in the Institute's Wolfson Archaeological Science Laboratories. It might be used to apply scientific approaches to an archaeological problem, or to gain greater experience with particular materials or a specific method of data analysis. You might choose to analyse a data set derived from your own work, or to assess the potential of particular theoretical or methodological approaches to your work. For this specific degree, you are normally expected to conduct original analytical research on archaeological materials.

When considering your dissertation topic, you should refer to the aims and objectives of the degree. You will be encouraged to develop individual interests and acquire expertise in appropriate techniques through your choice of options. Initial discussions with the Degree Co-ordinator will be used to outline a general area of interest, which will be used to identify a suitable supervisor within the Institute of Archaeology. It is your responsibility to maintain contact with your supervisor and ensure that you have access to suitable material for study, but the Degree Co-ordinator and your supervisor are there to provide guidance and support in your choice of research question, access to suitable material and your analytical approach.

Work on your dissertation will be your principal activity from April to September. You are advised to give some consideration to how you are going to structure your time and work in order to ensure that you can complete this project in the time available. If you expect to find the preparation of this document difficult, it is advisable to break the work down into smaller, more manageable, chunks.

In order to ensure that your dissertation is progressing adequately you are encouraged to consider the following schedule:

Term I: Read the handbooks, consider topics for dissertation and discuss these with the Degree Co-ordinator, who will advise and help to arrange access to laboratory facilities and the appointment of a suitable Dissertation Supervisor. But do not obsess about finding a dissertation topic as soon as you arrive: allow yourself the first couple of months to explore what's available, with a view to identifying a relevant research area by the end of Term I.

Term II: By the first or second week of the second term you are advised to prepare an outline of your dissertation proposal (in consultation with your supervisor) and submit this to both your supervisor and the Degree Co-ordinator for comment. (A single typed side of A4 should suffice; this should specify a title, aims, possible methodology, and sources of material and areas of literature to be examined.). By the end of this term you must complete the dissertation form A to be signed by your supervisor and returned to the Degree Co-ordinator.

Term 3: At the beginning of May you are advised to give an outline dissertation proposal countersigned by your supervisor, to the Degree Co-ordinator. This proposal should be

no more than five sides of A4 providing a summary of your literature review and including chapter headings and listing the sources of material and access arrangements.

Late May/Early June: Agree your research timetable (analysis of material, reading, data processing, preparing illustrations, writing up, proof-reading, etc.) with your Dissertation Supervisor, and arrange to show her/him a substantial piece of work (e.g. a chapter of the dissertation) for comment.

Note: although a Masters degree lasts a full calendar year, up to September, the module co-ordinator and supervisors are very likely to be out of London for large parts of the summer (usually undertaking fieldwork). Make sure that you have discussed your needs well in advance of this period and made arrangements for contact or communication as necessary.

2 September 2024 (or earlier!) Submit two copies of the dissertation in conformity with the guidelines, as well as a link to a data repository containing a digital copy of the dissertation and of all the analytical data produced (for archiving purposes).

Oral examination ('viva')

All Master's students are required to attend an oral examination, normally as part of their Dissertation assessment. This will be held on **Thursday, 30th May 2024**. Students must submit to their Dissertation Supervisor and Degree Programme Co-ordinator **a single sheet of A4 summarising the proposed research design of their dissertation, and they will deliver a short presentation to some staff and peers**. No marks are awarded for the oral examination; the assessment is satisfactory or unsatisfactory. In the event of a problem being identified by the examiners of the Dissertation, students may be invited to attend a formal viva voce examination with the External Examiner for the degree also in attendance. Part-time students will normally be required to give a Dissertation presentation (viva) in the year in which they are examined in the Dissertation.

Teaching schedule

Taught modules are normally timetabled in the first two terms, though assessed work may be scheduled for submission in the third term, depending on which options have been selected. Full details of the timetable for each module are included in the module handbooks. Students are expected to use the remaining months to work on their dissertation.

A wide range of specialised lectures and lecture series are offered throughout the year at the Institute of Archaeology. These are open for all staff and students at the Institute and are typically advertised in the entrance area and via email. There is no assessment on any of these, and students are encouraged to take up this unique opportunity for specialised teaching.

If they are pursuing the degree on a part-time basis, students will normally be expected to take two full elements (which will normally include the core module) in the first year and the remaining element in the second. They must agree their choice of modules with the Degree Co-ordinator. They may start work on the dissertation at the same time as full-

time students, or they may wish to start later; either way they should consult the Degree Co-ordinator, and their Dissertation Supervisor, once the latter has been appointed.

Teaching methods

Modules on Masters' programmes usually involve a combination of seminars and lectures. Most modules will also have associated practicals, laboratory sessions, or field trips. UCL staff, with the addition of occasional guest speakers, will conduct the lectures and seminars. Most classes will include a period of formal presentation by one or more lecturers and a period of class discussion that frequently use the essential readings as a basis from which to examine the topic and its relation to artefact analysis in archaeology. Please consider your own experiences and knowledge and use this to contribute examples of similarities and differences in relation to the description, theory and practice of artefact analysis and interpretation discussed in the module.

Seminars are run differently by different Module Coordinators, but all have weekly recommended readings, which students will be expected to have done, to be able to follow and actively contribute to discussion. Some modules may require the student to make a seminar presentation; if so, this will be indicated in the module handout. Students will be required to undertake a considerable amount of self-directed learning through reading and other information gathering methods.

Practice essay: Is archaeology a science?

All Master's students are required to submit a practice essay. This is a formative exercise (i.e., it does not count towards your final marks!). It is meant to prompt you to familiarise yourself with our marking criteria and allow you to obtain early feedback on writing (and our approach to marking).

MSc Materials and Technology students are required to write an essay addressing the following question:

Is archaeology a science?

In the references below (all available online through the core module Online Reading List, JSTOR, academia.edu, etc), you should have enough information to inform your essay: unlike later assignments, you are not expected to carry out an exhaustive bibliographic search. Instead, the assessment will focus primarily on structure, coherence, conciseness, originality, critical ability, use of writing and referencing conventions, etc. so that students can be given feedback relevant to writing other essays across all selected modules.

Reading material

- Binford, L. 1962. Archaeology as anthropology. *American Antiquity*, 28: 217-225.
- Dunnell, R.C., 1982. Science, social science, and common sense: the agonizing dilemma of modern archaeology. *Journal of Anthropological Research*. 38, 1–25.
- Dunnell, R.C., 1993. Why archaeologists don't care about archaeometry. *Archaeomaterials* 7, 161–165.

- Hawkes, J. 1968. The proper study of mankind. *Antiquity*, 42: 255–261
- Isaac, G. L. 1971. Whither archaeology? *Antiquity*, 45: 123–129.
- Jones, A. 2004. Archaeometry and materiality: materials-based analysis in theory and practice. *Archaeometry* 46(3): 327–338
- Killick, D. 2015. The awkward adolescence of archaeological science. *Journal of Archaeological Science* 56: 242-247.
- Martín-Torres, M. and Killick, D.C. 2015. Archaeological theories and archaeological sciences, in A. Gardner, M. Lake and U. Sommer (eds.), *Oxford Handbook of Archaeological Theory*. Oxford: Oxford University Press. Online

Wordcount: 1000

Deadline: 18 October 2023, 5pm

Please deposit electronic copies in the practice essay Moodle in the correct degree container [here](#).

Staff and contact

In addition to the individual option module co-ordinators, the core staff members for the degree comprise:

- **Miljana Radivojević**, m.radivojevic@ucl.ac.uk
- **Mike Charlton**, room 210, m.charlton@ucl.ac.uk, tel. 02076797498
- **Ian Freestone**, room 210, i.freestone@ucl.ac.uk, tel. 02076794963
- **Ulrike Sommer**, room 409a, u.sommer@ucl.ac.uk, tel. 02076791493
- **Patrick Quinn**, room B17, patrick.quinn@ucl.ac.uk, tel. 02076795595
- **Russell Bailey**, room B4, russell.bailey@ucl.ac.uk, tel. 02076794921
- **Victoria Lucas**, room B51, v.lucas@ucl.ac.uk, tel. 02076797481

Miljana Radivojević is the degree co-ordinator and you should contact her with general queries in the first instance.

Office times to meet students are Mondays and Thursdays, book [here](#). Check the same link for Terms 2 and 3 as times may change during those. Meetings are preferred via Teams during term time though in person can be arranged. You can contact me by email, either to arrange appointments or for brief questions. As a degree co-ordinator, I shall be your personal tutor.

Prerequisites

Most modules for Masters programmes do not have prerequisites; students will have been accepted to the programme on the understanding that they already have sufficient background in archaeology or a relevant field, either through their previous degree, or through relevant experience, to be able to follow the programme and modules for which they have been accepted. If, however, students wish to change their programme, or the modules in which they indicated an interest in enrolling in, in their application, they should discuss this with the relevant Degree and Module Co-ordinators.

If you would like guidance on reading for a particular area of the degree you feel less confident about, feel free to ask.

Libraries and other resources

In addition to the Library of the Institute of Archaeology, the Science Library and the Main Library of UCL have holdings of particular relevance to this degree.

Libraries outside of UCL with holdings which may also be relevant to this degree are the Senate House Library, the British Library, the Imperial College Library and the Library of the Department of Scientific Research at The British Museum. When searching for rare publications, you are encouraged to explore the M25 Consortium of Academic Libraries (<http://www.m25lib.ac.uk>).

Online resources: reading lists and Moodle

Jointly with the Library team, we are making an effort to exploit the advantages of the internet, and this MSc aims to make all of the teaching resources available online.

Both for the core module and for the main option modules (see list above), you can find their relevant reading lists online, where all of the articles noted as “essential reading” and most of the “further reading” items are available for download in PDF format. If the PDF is not available due to copyright restrictions, you will find a link to the relevant library shelf mark where you can find a hard copy of the publication.

The Online Reading Lists are available via the Institute’s Administration Intranet (link available from the Institute’s website, UCL ID and password required)

In addition, all modules available via Moodle, an online teaching resource where you will find access to the reading lists but also to relevant websites, PowerPoint presentations, class handouts, activities and discussion groups that are relevant to this degree. The Moodle portal is: <https://moodle.ucl.ac.uk> (UCL ID and password required)

The photographic laboratory

The photographic department is a teaching and service facility with extensive experience of getting the best results from difficult-to-photograph finds and samples. Students are welcome to use the photographic laboratory for their own research needs, even if not attending this module.

Scientific laboratory facilities

The UCL Wolfson Archaeological Science Laboratories in the basement provide excellent facilities for the examination and analysis of a wide variety of archaeological materials, facilities for wet and dry sieving and the sorting and storage of artefacts and sediment cores, small furnaces for controlled experimentation with melting and firing conditions and facilities for preparing polished and thin-sections, as well as pressed powder pellets, and the digestion of samples for stable isotope analysis. More ‘high-tech’ facilities include an electron-probe X-ray microanalyser which allows analysis of the elements present within small areas of an object, four portable X-ray fluorescence spectrometers, which provide an accurate method of analysing major and trace elements in bulk samples, particularly in metals, slags, ceramics and glasses, an X-ray diffractometer for mineralogical analyses, and a Fourier-transform infrared spectrometer, which enables the user to analyse both

organic and inorganic compounds. A wide range of microscopes are available for use, including two scanning electron microscopes with energy dispersive spectrometers, a Carl Zeiss SEM, a Hitachi variable pressure SEM, stereoscopic light microscopes for small and detailed examination of artefacts, and petrological and metallurgical microscopes with digitising equipment for image analysis. We have also recently added facilities for laser ablation induced coupled plasma mass spectrometry and laser induced breakdown spectroscopy. There are also extensive laboratories for archaeological conservation on the sixth floor which are equipped for the examination and treatment of archaeological and ethnographic materials, as well as state-of-the art computing facilities on the third floor. If you have any questions relating to the use of these facilities please contact Mike Charlton, the Manager of the Wolfson Archaeological Science Laboratories.

Lectures, seminars and events

The Institute hosts a wide range of lectures and seminars that are advertised primarily by email and via the Institute's website. You are welcome to attend almost all of these, and we would particularly encourage you to participate in the weekly research seminars on Mondays at 4pm, which give you a flavour of research carried out by the Institute's staff. These will likely be hosted online for the foreseeable future.

Health and safety

The Institute has a Health and Safety policy and code of practice which provides guidance on laboratory work, fieldwork, and other activities. This is revised annually. All work undertaken in the Institute is governed by these guidelines and students have a duty to be aware of them and to adhere to them at all times. This is particularly important in the context of the laboratory work which will be undertaken as part of this degree. Amongst other safety inductions, you will also need to complete a few online training modules. The modules aim to inform participants about good laboratory practices and instil safe behaviours which apply to all laboratory environments.

You have to watch the presentations, pass the final tests, and send the certificates to Agnese.

1. **UCL safety Induction:** <https://www.ucl.ac.uk/safety-services/policies/2021/aug/ucl-safety-induction-training>
2. **Principles of Laboratory Safety:** <https://www.ucl.ac.uk/safety-services/policies/2021/aug/principles-laboratory-safety-ucl-training>
3. **Basic fire safety:** <https://www.ucl.ac.uk/safety-services/policies/2021/aug/fire-safety-training>

Anyone planning to work with X-ray based instruments (pXRF, XRD, or X-ray cabinet) will also need to pass:

- **Safe Use of X-rays:** <https://www.ucl.ac.uk/safety-services/policies/2021/aug/safe-use-x-rays-training>

You will also need to meet one day to sign a few forms and have a member of the laboratory staff guide you through the fire route. This is normally done as a practical during the core module. This year we will do this in Term II as part of laboratory training.

Feedback

We welcome feedback from you throughout the course of the year. Students will be asked to fill-in Progress Forms at the end of each term, which the Degree Co-ordinator will discuss with them, which include space for comment on each of their modules.

At the end of each module all students are asked to give their views on the module in an anonymous questionnaire, which will be circulated at one of the last sessions of the module. These questionnaires are taken seriously and help the Module Co-ordinator to develop the module. The summarised responses are considered by the Degree Co-ordinator, the Institute's Staff-Student Consultative Committee, Teaching Committee, and by the Faculty Teaching Committee.

If students are concerned about any aspect of a specific module, we hope they will feel able to talk to the relevant Module Co-ordinator, but if they feel this is not appropriate or have more general concerns, they should consult their Degree Co-ordinator or the Graduate Tutors. They may also consult the Academic Administrator, the Chair of Teaching Committee, or the Director.