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ERASMUS+ KEY ACTION 2 PROJECT

Transdisciplinary Approaches to Archaeological Heritage

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TRARCHER

TRANSDISCIPLINARY APPROACHES
TO ARCHAEOLOGICAL HERITAGE

Intellectual output:

**Syllabus of the Master's Study
“Project Manager in Archaeological Heritage”**

Project Consortium:

1. University of Hradec Králové, Czech Republic
2. Université Bourgogne Europe, France
3. University of Zagreb, Croatia



University
of Hradec
Králové





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1. INTRODUCTION

1.1. Needs analysis:

Present day heritage professionals work in interdisciplinary and cross-sectoral environments, combining traditional approaches with the latest developments, technologies and techniques derived from recent research not only in humanities and social sciences, but also in hard sciences and technology. These practices, however, are not yet systematically integrated in the curricula leading to positions connected to heritage management. On the contrary, they are still strongly rooted in specific academic disciplines, mainly belonging to the social sciences and the humanities. The need for innovative and integrated training and research in the domain of heritage is widely acknowledged: as the professional management of heritage sites and artefacts develops, a demand increases for wider perspectives and transdisciplinary approaches able to combine solid humanistic theoretical grounds with practical fieldwork and lab training, IT and analytical technologies, strong financial management skills and a deep understanding of the role played by the archaeological heritage in the broader cultural and social landscape in which it is set. The studies leading to positions connected to heritage management, however, are still strongly rooted in specific academic disciplines, mainly belonging to the social sciences and the humanities. This master study, thus, aims at filling the current gap between higher education curricula and the needs of an efficient heritage management.

1.2. Master study aims:

The Master study “Project manager in Archaeological Heritage” will be unique in Europe in terms of innovativeness of the teaching offer, dynamism of the scientific environment and multidisciplinary nature of the interaction forms. The syllabus brings together all the hard and soft skills, networking opportunities, contents and methodologies required to become a successful project manager in the field of archaeological heritage. That includes a working understanding of the different methods and techniques and the theoretical approaches behind the heritage study and preservation, together with a deep awareness of the diversity of local realities in which they are rooted.

The master study is defined by a skill-based approach to teaching. Throughout a strongly practical curriculum, the students are expected to acquire a working understanding of the different methods and techniques and the theoretical approaches behind the study and preservation of the archaeological heritage. At the same time, they are expected to develop soft skills such as communication and negotiation abilities, adaptability, strategic thinking and problem solving.



The new syllabus merges skills from humanities, social and hard sciences and engineering, the blended participation model (especially designed to support fieldwork and lab activities) and the learn-through-research methodology. After the completion of the training, the students will be able to assume positions of responsibility in heritage management and to cooperate with all the stakeholders in all stages of the recuperation and tuition of the archaeological heritage. The Master study thus provides a balanced training in management, research and communication with broader audience.

The Master study is open to students with different educational backgrounds, including humanities, technical disciplines, social and hard sciences. The highly participatory and immersive teaching activities (fieldwork and lab training) and the traineeship aims at creating synergies underlining the transdisciplinary approach of the study and the development of soft skills.

1.3. Master study organisation:

The program consists of classroom courses, lab courses and fieldwork, and includes a master thesis and a traineeship in an institution. Each course awards 3 to 6 ECTS points; the student's obligations include passing an exam and/or writing an essay. Some courses require mandatory attendance and participatory exercises, where the student is evaluated on a permanent basis. The fieldwork and the traineeship represent a major part of the study program, and therefore they are mandatory. Regarding fieldwork, however, the student will have freedom of choice regarding his/her obligations on the field (excavation, documentation, survey, logistics, PR) depending on his/her field of interest and their focus within the master. Digital resources bringing the experience of fieldwork will be available for disabled students. The Fieldwork cycle (Fieldwork I and II) awards 6 ECTS points, and so does the Traineeship. The mandatory Master thesis awards 15 ECTS.

The successful conclusion of the program requires to complete 120 ECTS over 2 full years (4 academic semesters).



2. COURSE LIST AND CATEGORY DESCRIPTIONS:

A) COURSE LIST:

1. 3D Documentation and archiving (3 ECTS)
2. 3D Documentation and Modelling– theory and practice (fieldwork and laboratory acquisition) (5 ECTS)
3. AI, deep learning (5 ECTS)
4. Applied IT project (3 ECTS)
5. Archaeological prospection and excavation (5 ECTS)
6. Archaeology and Contemporary Society: from past to the future (3 ECTS)
7. Archaeology of Medieval and Modern Europe (3 ECTS)
8. Archaeology of the Ancient Mediterranean and Protohistoric Europe (3 ECTS)
9. Archaeometry (3 ECTS)
10. Artistic and Cartographic Sources for Landscape Reading, Presentation and History (3 ECTS)
11. BIM and Archaeology (3 ECTS)
12. Conservation of Archaeological Artefacts (3 ECTS)
13. Curatorship and Museology (3 ECTS)
14. Databases and GIS in archaeological heritage management (5 ECTS)
15. Digitization 2D and 3D and sensors (3 ECTS)
16. Elaboration and Discussion of Master Thesis (15 ECTS)
17. Ethical aspects of heritage management (3 ECTS)
18. European Prehistory (3 ECTS)
19. Fieldwork I: archaeological excavation I (3 ECTS)
20. Fieldwork II, modality 1: archaeological excavation II (3 ECTS)
21. Fieldwork II, modality 2: landscape research (3 ECTS)
22. Financial Management (3 ECTS)
23. Generative AI for 3D (3 ECTS)
24. Introduction to Archaeology (3 ECTS)
25. Introduction to History of Art and Architecture (Antiquity to Early Modern Period) (6 ECTS)
26. Introduction to IT tools in Archaeological Heritage (3 ECTS)
27. Laboratory work (2 ECTS)
28. Landscape and Environmental Archaeology (3 ECTS)
29. Norms and standard for BIM and GIS (3 ECTS)
30. Participatory Approaches to Heritage Management (3 ECTS)
31. Problem of Form and Function in Settlements and Architecture (Antiquity to Early Modern Period) (3 ECTS)
32. Public Policies and Legal Regulations (3 ECTS)
33. Spatial Analysis (3 ECTS)
34. Statistics and data processing (3 ECTS)
35. Theory and History of Landscape Research (5 ECTS)
36. Traineeship (6 ECTS)
37. Urban Archaeology (3 ECTS)



B) CATEGORIES OF THE COURSES AND DISTRIBUTION OF ECTS POINTS:

The courses are divided in four categories: fundamentals (category B), methodology (category M), applied knowledge (category A) and practical work (category P)

CATEGORY B – Fundamentals For Archaeological Heritage Studies:

Courses in the B category mark the core of the master study. Students will receive a thorough introduction to European archaeological and monumental heritage from the viewpoint of different disciplines (archaeology, history, art history, geography, sociology). These theoretical contents will derive from the current state of research within the involved disciplines, and will be taught through practical examples and case studies selected from relevant literature.

A practical set of skills within this category will be acquired through studying representative sites and historical landscapes in Europe and learning to recognize, locate and exploit the sources available for each situation: archival material (historical cartography, excavation and conservation reports, drawings and photographs, etc.), historical sources, oral sources, etc. Provided the crucial importance of IT tools within the master, a thorough introduction to the available technologies and methods will be taught within this category.

As it is crucial for students to gain knowledge on the main typologies of archaeological sites, monuments and landscapes in Europe. According to their importance and to the considerable amount of material to be studied, the courses on European Archaeology, on history of architecture and on IT tools are divided into two semesters.

The courses forming this category are:

1. Archaeology of Medieval and Modern Europe
2. Archaeology of the Ancient Mediterranean and Protohistoric Europe
3. Artistic and Cartographic Sources for Landscape Reading, Presentation and History
4. European Prehistory
5. Introduction to Archaeology
6. Introduction to History of Art and Architecture (Antiquity to the Early Modern Period)
7. Introduction to IT tools in Archaeological Heritage
8. Theory and History of Landscape Research



CATEGORY M – Methodology of Study and Management of Archaeological Heritage

This category is focused on various practical aspects of site and monument management with a special emphasis on implementation of digital methods of recording, research and management. In addition, it will provide the students with an overview of the technologies and techniques associated with the conservation and analysis of archaeological sites and monuments.

The courses in this category are intended to complement the fundamental knowledge acquired from the category B courses. The students will learn to apply practical skills and methods to specific case examples, selected among the contents of the category B courses. The category M courses will enable the students to build their skills according to their career focuses.

The courses are problem-related, aiming to present innovative solutions to traditional problems of the study and management of the sites. The category B courses are primarily aimed at skill acquisition, whereas the application of those skills takes place within the category A and P courses.

The courses forming this category are:

1. 3D Documentation and Modelling – theory and practice (fieldwork and laboratory acquisition)
2. Archaeological prospection and excavation
3. Archaeometry
4. Conservation of Archaeological Artefacts
5. Ethical aspects of heritage management
6. Landscape and Environmental Archaeology
7. Problem of Form and Function in Settlements and Architecture (Antiquity to Early Modern Period)
8. Public Policies and Legal Regulations
9. Spatial Analysis
10. Statistics and data processing
11. Urban Archaeology

CATEGORY A – Applying Knowledge and Skills to the Management of Archaeological Heritage

The selected courses are dealing with concrete problems of heritage study and management on a conceptual level. They cover various settings in which concrete knowledge and skills gained within this Master Study are applicable, such as research institutions, museums, specialized labs, heritage offices, conservation departments, tourist offices, territorial administrations and related institutions and/or companies that deal with cultural heritage. The category A courses will enable the students to test and consolidate their skills and knowledge according to their career focuses: research, conservation, tourism, urban or rural planning, etc.



The courses forming this category are:

1. 3D documentation and archiving
2. Archaeology and Contemporary Society: from past to the future
3. BIM and Archaeology
4. Curatorship and Museology
5. Databases and GIS in Archaeological Heritage Management
6. Financial Management
7. Participatory Approaches to Heritage Management

CATEGORY P – Practical work

Following the participatory and immersive concept of the Master Study, field work and laboratory work will be a fundamental part of the master study. The practical work will be adapted to each student's needs and career interests. During the second semester, a compulsory field campaign will be organized for all students for 2 weeks (3 ECTS points), in which the students will gain knowledge on methodology of archaeological excavation in different contexts and under different conditions. Another fieldwork campaign (2 weeks, 3 ECTS points) will be offered in the last semester as optional subject. Two modalities will be offered: an advanced archaeological campaign, focused on digital field record and documentation, will be taught in Hradec Králové, whereas a campaign of fieldwork focused upon the conservation of movable and immovable heritage, heritage documentation and sociological surveys on local communities, will take place in Zagreb.

One week of post-fieldwork laboratory work (2 ECTS points) will take place in connection to Fieldwork I. There, the students will work with materials and data collected in the field.

A traineeship with a length of four weeks (6 ECTS points) is a mandatory part of the category P courses. The student will select the host among a wide list of partner institutions, according to the student's own academic and professional interests.

As the defence of the Master thesis is mandatory to successfully complete the Master Study, working on their Master thesis represents the largest part of students' obligations in the final semester.

The courses forming this category are:

1. Applied IT project
2. Elaboration and Discussion of Master thesis
3. Fieldwork I: archaeological excavation I
4. Fieldwork II, modality 1: archaeological excavation II
5. Fieldwork II, modality 2: landscape research
6. Laboratory work
7. Traineeship



3. STRUCTURE OF THE MASTER'S STUDY PROGRAMME

The courses are spread through two academic years (four semesters). The first year is primarily focused on the acquisition of fundamental theoretical knowledge, whereas the second one has mainly a methodological and practical approach. The first two semesters are based on introducing students to the basics of the archaeological heritage and of the various disciplines addressing it, the second having a strong IT orientation. The third semester focuses on building practical skills and implementing knowledge acquired throughout the first year of study. The main focus during the final semester is the elaboration of the Master Thesis and the application of the students' academic and practical skills in the job market by means of a traineeship.

1st YEAR: WINTER SEMESTER

Compulsory courses

- Introduction to History of Art and Architecture (Antiquity to Early Modern Period) (6 ECTS)
- Theory and History of Landscape Research (5 ECTS)
- Introduction to Archaeology (3 ECTS)
- Introduction to IT tools in Archaeological Heritage (3 ECTS)
- Public Policies and Legal Regulations (3 ECTS)

Optional courses

- Curatorship and Museology (3 ECTS)
- Archaeology and Contemporary Society: from past to the future (3 ECTS)
- Statistics and data processing (3 ECTS)

TOTAL ECTS POINTS OFFERED IN SEMESTER: 20 + 9

1st YEAR: SUMMER SEMESTER

Compulsory courses

- 3D Documentation and Modelling – theory and practice (fieldwork and laboratory acquisition) (5 ECTS)
- Databases and GIS in archaeological heritage management (5 ECTS)
- European Prehistory (3 ECTS)
- Archaeology of the Ancient Mediterranean and Protohistoric Europe (3 ECTS)
- Archaeological prospection and excavation (5 ECTS)

Optional courses

- BIM and Archaeology (3 ECTS)



- 3D Documentation and archiving (3 ECTS)
- Artistic and Cartographic Sources for Landscape Reading, Presentation and History (3 ECTS)

TOTAL ECTS POINTS OFFERED IN SEMESTER: 21 + 9

2nd YEAR: WINTER SEMESTER

Compulsory courses

- Archaeology of Medieval and Modern Europe (3 ECTS)
- Fieldwork I (3 ECTS)
- Laboratory work (2 ECTS)
- AI, deep learning (5 ECTS)
- Applied IT project (3 ECTS)
- Financial Management (3 ECTS)

Optional courses

- Spatial analysis (3 ECTS)
- Archaeometry (3 ECTS)
- Conservation of Archaeological Artefacts (3 ECTS)
- Problem of Form and Function in Settlements and Architecture (Antiquity to Early Modern Period) (3 ECTS)
- Digitization 2D and 3D and sensors (3 ECTS)

TOTAL ECTS POINTS OFFERED IN SEMESTER: 19 + 15

2nd YEAR: SUMMER SEMESTER

Compulsory courses

- Traineeship (6 ECTS)
- Elaboration and Discussion of Master Thesis (15 ECTS)
- Fieldwork II (modality 1 or 2) (3 ECTS)

Optional courses

- Norms and standard for BIM and GIS (3 ECTS)
- Generative AI for 3D (3 ECTS)
- Landscape and Environmental Archaeology (3 ECTS)
- Urban Archaeology (3 ECTS)
- Ethical aspects of heritage management (3 ECTS)
- Participatory Approaches to Heritage Management (3 ECTS)

TOTAL ECTS POINTS OFFERED IN SEMESTER: 24 + 18



4. MANDATORY AND OPTIONAL COURSES

The master offers a grand total of 84 compulsory ECTS and 51 optional ECTS. The offer of optional ECTS increases during the second year of the master, so that the students can configure their curricula in accordance to their interests. The choice of the host university for the last semester defines not only the offer of optional subjects, but also of master theses and traineeships.



5. DESCRIPTION OF THE COURSES

1.1. 3D Documentation and archiving

Category: A

Type: optional

Extent of the course: 16 lectures + 10 seminars

ECTS: 3

Recommended year / semester: 1 / 2

The course aims to reinforce the students' skill in 3D data management. It will focus on secure and long-term storage, archiving strategies and metadata that can be (or that would not be) embedded in a geometrical description. Sites or artefacts documentation, from the archaeological expert point of view, can be indexed to spatial locations in numerical twin, but implies the maintaining of geometrical and structural coherency, as well as avoiding data loss. As archaeology delivers various reconstitution scenarios, it requires a careful consideration before the beginning of a digital heritage management project. Metadata are very useful to describe geometric data, and favour data harvesting. Existing standards, used by the community, will be set out in detail. FAIR principles will be presented, starting from 3D information and extended to general data usage.

Student learning outcome: by the end of the course, students are expected to manage a conservation project, for the numerical data involved in a humanities project. They are able to base their project on a digital mock-up and ensure metadata harvesting. They have also an expertise in FAIR data management and sustainable geometrical data storage.

Assessing methods: written exam

Bibliography:

Recommended Reading

Guidelines for the preservation of digital heritage, UNESCO 2003

UNESCO Charter on the Preservation of the Digital Heritage, 2003

European commission recommendation for a common European data space for cultural heritage:
<https://digital-strategy.ec.europa.eu/en/news/commission-proposes-common-european-data-space-cultural-heritage>

Commission Recommendation of 27 October 2011 on the digitisation and online accessibility of cultural material and digital preservation: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32011H0711>

Study aids

3D processing software



1.2. 3D Documentation and Modelling – theory and practice (fieldwork and laboratory acquisition)

Category: M

Type: compulsory

Extent of the course: 13 lectures + 5 seminars + 7 participatory exercises

ECTS: 5

Recommended year / semester: 1 / 2

The course aims to introduce the students to the concepts of 3D modelling, geometrical models, logical and constructive relations, as well as importing items from the real world with digitization techniques. An important focus will be made on data quality and control. The geometric object handle properties to be processed and constraints to ensure the relevance of processing results. Geometry is described by various models (with their drawbacks and advantages) and the data coherency (as in databases) is hard to maintain, due to topological structures.

Student learning outcome: by the end of the course, students are expected to complete a digitization of items of various sizes, perform geometric processing and compare their results to propose an analysis. They are also able to transform the data from a given density of information to one other, while figuring out the impact on data loss.

Assessing methods: a project covering the theories described in lectures, to be made in mixed groups, written exam.

Bibliography:

Recommended reading

J. F. Hughes et al., *Computer Graphics: Principles and Practice* (4th ed.), 2018

Study aids

3D scanner, digital camera

1.3. AI, deep learning

Category: M

Type: compulsory

Extent of the course: 12 lectures + 14 seminars

ECTS: 5

Recommended year / semester: 1 / 2

The course aims at providing a general point on Machine Learning methods, algorithms and capabilities. The students will be confronted to various models and situations (text, unstructured



data, image, 3D informations) where Machine Learning can or cannot provide results. An important focus will be made on the parameters to train, validate and put in production ML systems. Data checking and model tuning will also be covered.

Student learning outcome: by the end of the course, students are expected to be able to complete the specification and building of a ML system.

Assessing methods: written exam, group project

Bibliography:

Recommended reading

C. C. Aggarwal, *Neural Networks and Deep Learning*, 2018

G. Bonaccorso, A. Fandango, R. Shanmugamani, *Python: Advanced Guide to Artificial Intelligence*, 2018

S. Russell, P. Norvig, *Artificial Intelligence: A Modern Approach*, 1995

Study support

Python language

1.4. Applied IT project

Category: P

Type: compulsory

Extent of the course: 5 lectures + 5 seminars + 3 participatory exercises

Hours: 13

ECTS: 3

Recommended year / semester: 1 / 2

The student develops a project within one or more of the following subjects:

- 3D Documentation and Modelling – theory and practice (fieldwork and laboratory acquisition)
- Databases and GIS in archaeological heritage management
- AI, deep learning

Student learning outcome: working in small groups (3-5 people), the students will handle an IT project from its definition to a running software, in a context of digital heritage. The group will propose a team management, electing a leader and following a continuously updated planning. The theory of project management (steps, planning, costs, team) is covered by the lectures, and management techniques are explained upon real cases (Gantt, scrum, kanban, UML...). During the practical hours devoted to their project, students will experiment their knowledge and technical skills. A presentation will conclude their works, regarding the technical IT, the archaeological works and the project management.

Assessing methods: mandatory attendance, permanent evaluation, project, final presentation



Bibliography:

J.J. Sutherland, *Scrum: The Art of Doing Twice the Work in Half the Time* (Kindle Edition), 2014
J. Heagney, *Fundamentals of Project Management* (5th Edition), 2016

1.5. Archaeological Prospection and Excavation

Category: M

Type: compulsory

Extent of the course: 18 lectures + 8 seminars

ECTS: 5

Recommended year / semester: 2 / 1

The course aims at introducing the students to the methodologies and strategies of archaeological survey, excavation and recording of sites with long and complex stratigraphies by applying a problem-solving approach to a number of representative case examples.

Student learning outcome: by the end of the course students are expected to master the principles of stratigraphic open area excavations adapted to a wide range of situations, landscapes and topographic environments. This theoretical knowledge will be tested and enhanced during the archaeological fieldwork activities.

Assessing methods: mandatory attendance, written exam, final project

Bibliography:

- E. B. Banning, *Archaeological Survey*, 2002
- P. Drewett, *Field Archaeology An Introduction* (2nd Edition), 2011
- T. R. Hester, H. J. Shafer, K. L. Feder, *Field Methods in Archaeology* (7th Edition), 2009
- G. J. Tassie, L. K. Owens, *Standards of Archaeological Excavation: A field guide to methodology, recording techniques, and conventions*, 2010.
- G. G. White, T. F. King, *The Archaeological Survey Manual*, 2007

1.6. Archaeology and Contemporary Society: from the past to the future

Category: A

Type: optional

Extent of the course: 8 lectures + 5 seminars

ECTS: 3

Recommended year / semester: 1 / 1



This course gives insight into the study of the relationship between archaeology and the different social sciences, primarily sociology, cultural anthropology and ethnology. It explores how archaeological methods and findings contribute to understanding past human societies and how insights from social sciences can further enrich archaeological interpretation and broader contextualization. Students will engage with theoretical frameworks and case studies that highlight how archaeology interacts with issues such as social organization, identity, power dynamics, and cultural practices. The course encourages critical thinking about how archaeological material can inform contemporary discussions on topics like migration, identity and environmental change, providing a broad context for interpreting and presenting the material culture.

Student learning outcome: by the end of the course, the students are expected to identify social aspects of archaeological heritage from contemporary perspective, to develop critical thinking skills and to analyze social challenges for archaeological heritage management in contemporary society.

Assessing methods: continuous assessment

Bibliography:

Compulsory

- I. Hodder, *Reading the Past: Current Approaches to Interpretation in Archaeology*, 1986
- S. J. Shenna (ed.), *Archaeological Approaches to Cultural Identity*, 1989

Recommended

- T. Murray, C. Evans (eds.), *Histories of Archaeology: A Reader in the History of Archaeology*, 2008
- C. Renfrew, *Approaches to Social Archaeology*, 1984

1.7. Archaeology of Medieval and Modern Europe

Category: B

Type: compulsory

Extent of the course: 13 lectures

ECTS: 3

Recommended year / semester: 2 / 1

The course aims to introduce the students to the main developments in the history of material culture and to the main typologies of archaeological sites in Europe. The course covers the period between the end of Antiquity and the end of the Ancient Régime in Europe.

Student learning outcome: By the end of the course students are expected to be familiar with the main typologies of archaeological structures and with the main elements of material culture in historical Europe.

Assessing methods: written exam



Bibliography:

- M. Carver, J. Klápště (Eds.), *The Archaeology of Medieval Europe. Volume 2, Twelfth to sixteenth centuries*, 2011
- O.H. Creighton, *Castles and Landscapes Power, Community and Fortification in Medieval England. Studies in the Archaeology of Medieval Europe*, 2004
- C. Gerrard, *Medieval archaeology. Understanding traditions and contemporary approaches*, 2003. <https://doi.org/10.4324/9780203468463>
- J. Graham-Campbell, M. Valor (Eds.), *The archaeology of medieval Europe. Volume 1, Eighth to twelfth centuries AD*, 2007
- J. Klápště, *The Archaeology of Prague and the Medieval Czech Lands, 1100–1600*, 2016.
- J. Schofield, A. Vince, *Medieval Towns. The Archaeology of British Towns in their European Setting*, 2005.

1.8. Archaeology of the Ancient Mediterranean and Protohistoric Europe

Category: B

Type: compulsory

Extent of the course: 13 lectures

ECTS: 3

Recommended year / semester: 2 / 1

The course aims to introduce the students to the main developments in the history of material culture and to the main typologies of archaeological sites in Europe. The course covers the period between the European Iron Age and the end of Antiquity.

Student learning outcome: By the end of the course students are expected to be familiar with the main typologies of archaeological structures and with the main elements of material culture in ancient and protohistorical Europe.

Assessing methods: written exam

Bibliography:

- J. M. M. Barringer, *The Art and Archaeology of Ancient Greece*, 2015
- B. Burrell (Ed.), *A Companion to the Archaeology of the Roman Empire*, 2024
- J. Collis, *The Celts: Origins, Myths and Inventions*, 2003
- J. Coulston, H. Dodge, *Ancient Rome: The Archaeology of the Eternal City*, 2000
- B. Cunliffe, *The Ancient Celt*, 2018
- S. James, S. Krmnicek, *The Oxford Handbook of the Archaeology of Roman Germany*, 2020
- J. Kysela, *Things and Thoughts. Central Europe and the Mediterranean in the 4th–1st centuries BC*, 2020
- R. Röber (Ed.), *Die Welt der Kelten – Zentren der Macht - Kostbarkeiten der Kunst*, 2012
- H. Steuer, *“Germanen“ aus Sicht der Archäologie. Neue Thesen zu einem alten Thema*, 2021
- P. S. Wells, *The Barbarians Speak: How the Conquered Peoples Shaped Roman Europe*, 2001



1.9. Archaeometry

Category: M

Type: optional

Extent of the course: 7 lectures + 6 seminars

ECTS: 3

Recommended year / semester: 2 / 1

The course introduces the fundamentals of archaeometry and the broader field of archaeological science, focusing on how scientific methods are used to study archaeological materials and technologies. Students will learn how analytical approaches help to characterise artefacts and ecofacts (composition, microstructure, manufacturing techniques, use), address provenance questions (raw material sourcing, exchange, production organisation), evaluate authenticity, and support absolute and relative dating.

The course emphasises the full workflow from archaeological question to scientific result: sampling strategies (including ethical and destructive sampling issues), selection of appropriate methods, quality control, interpretation of results, and clear communication of uncertainty. Lectures are complemented by seminars built around case studies and practical decision-making (what to analyse, why, how, and what can realistically be concluded).

Student learning outcome: by the end of the course, the student will be able to formulate a basic diagnostic assessment when advanced scientific analyses are meaningful; to propose an appropriate analytical strategy (method selection, sampling, expected outputs, limitations) for common research aims such as technological characterisation, provenance, authentication and dating; to interpret results critically (including uncertainty, contamination, preservation bias) and integrate them into an archaeological argument; to communicate effectively with laboratory specialists (“hard” scientists and technologists) and contribute meaningfully to multidisciplinary research and heritage projects.

Assessing methods: compulsory attendance, written exam

Bibliography:

- G. Artioli, *Scientific Methods and Cultural Heritage: An Introduction to the Application of Materials*, 2010
- J. Henderson, *The Science and Archaeology of Materials: An Investigation of Inorganic Materials*, 2000
- C. A. Makarewicz, R. A. Armitage, A. M. Pollard (Eds.), *Handbook of Archaeological Sciences* (2nd edition), 2023
- V. Orton, P. Tyers, A. Vince, *Pottery in Archaeology*, 1993.
- A. M. Pollard, C. Heron, R. A. Armitage, *Archaeological Chemistry*, 2016
- M. P. Richards, K. Britton, *Archaeological Science: An Introduction*, 2020



1.10. Artistic and Cartographic Sources for Landscape Reading, Presentation and History

Category: B

Type: optional

Extent of the course: 4 lectures + 10 participatory exercises

ECTS: 3

Recommended year / semester: 1 / 2

The course offers a look at the various visual sources for the historic landscape transformations in addition to the traditional archaeological, historical (written) and toponomastic (placename) sources. It is focused on the searching for, interpreting, critical reading and extraction of data from the visual sources. It primarily deals with the cartographic sources from the Middle Ages and the modern period, ranging from the nautical charts to the cadastral maps. Likewise, the course will present the potential of studying different visual art forms (most notably landscape painting and photography) as a source for the historic landscape, focusing on the 16th – early 20th century period. By studying these sources, students will develop additional methodological tools, offering insight not only in how the landscape transformed in material terms of physical transformation, but in ways it was understood through prisms of different cultures. Course emphasises the critical approach to the data, stressing the evaluation of the data in the research process, with the possibility of identifying the biases in the studied data, and its potential for understanding the landscape transformations in the *longue durée*. This will be conducted by emphasising a comparative approach, looking at the same area through the sources of different cultural and political origins, stressing the plurality of meanings behind the landscape.

Student learning outcome: by the end of the course, the students will evaluate data in research process, analyse different types of data and historical sources and recognize landscape transformations

Assessing methods: project-based assessments

Bibliography:

Compulsory

J. Black, *Maps and History: Constructing Images of the Past*, 1997

M. Monmonier, *How to Lie with Maps*, 1991

T. Ingold, The Temporality of the Landscape, *World Archaeology* 25/2 (1993)

C. M. Coates, Seeing and Not Seeing: Landscape Art as a Historical Source, in *Method and Meaning in Canadian Environmental History*, 2009

Recommended

J. B. Harley, Historical geography and the cartographic illusion, *Journal of Historical Geography* 15/1 (1989)

D. Jovanović, D. Oreni, S. Della Torre, R. Moioli, Analysis of historical cartography and data presentation for an educational purpose: The case of the historical centre of Vimercate, *Proceedings of the International Cartographic Association* 4 (2021)



A. Kinda, Nature of Old Maps: As Primary Source Materials for Historical Geography, *Earth Sciences* 7/6 (2018)

P. Krleža, D. Mlinarić, Visual Images on Medieval and Early Modern World Maps: Iconography of the Known and the Unknown, *Kartografija i geoinformacije* 21/38 (2022)

D. R. Warren, H. M. Loeb, P. Betjemann, I. A. Munck, W. S. Keeton, D. C. Shaw, E. J. Harvey, An interdisciplinary framework for evaluating 19th century landscape paintings for ecological research, *Ecosphere* 14/9 (2023)

1.11. BIM and Archaeology

Category: A

Type: optional

Extent of the course: 8 lectures + 5 practical sessions

ECTS: 3

Recommended year / semester: 1 / 2

The course aims to introduce the students with spatial and logical representation of a site. As digital mock-ups and digitization are widely used to support the description of a site and its constructions, theoretical concepts used for contemporary buildings are to be adapted to ancient, incomplete archaeological sites. It covers ISO standards ISO for Building Information Modelling (BIM) and introduces the concept of HBIM (Heritage BIM).

Student learning outcome: by the end of the course, students are expected to be familiar with the BIM and HBIM ecosystems (standards and data formats). They will work with (H)BIM ontologies, populate them with data and define specific constraints on top of them (i.e. logical construction, along with architectural and geometrical constraints).

Assessing methods: mandatory attendance, written exam.

Bibliography:

Recommended

B. Kumar, *A Practical Guide to Adopting BIM in Construction Projects*, 2015

P. Pauwels, K. McGlenn (Eds.), *Buildings and Semantics: Data Models and Web Technologies for the Built Environment* (1st ed.), 2022. <https://doi.org/10.1201/9781003204381>

Study aids

<https://viewer.autodesk.com/designviews>

<https://technical.buildingsmart.org/>



1.12. Conservation of Archaeological Artefacts

Category: M

Type: optative

Extent of the course: 7 lectures + 6 seminars

ECTS: 3

Recommended year / semester: 2 / 1

The course aims to introduce the students to the conservation techniques of the main categories of artefacts.

Student learning outcome: by the end of the course students are expected to efficiently design a conservation strategy for the main categories of archaeological artefacts.

Assessing methods: compulsory attendance, written exam

Bibliography:

- S. Buys, V. Oakley, *Conservation and restoration of ceramics* (2nd edition), 2012
- J. M. Cronyn, *The elements of archaeological conservation*, 1990
- P. Dillmann et al. (Eds.), *Corrosion and Conservation of Cultural Heritage Metallic Artefacts*, 2013
- A. Moncrieff (Ed.), *Science for conservators. Volume 2: Cleaning*, 1983
- C. Newey (Ed.), *Science for conservators. Volume 3: Adhesives and coatings*, 1983
- C. Pedeli, S. Pulga, *Conservation Practices on Archaeological Excavations*, 2014
- G. Weaver (Ed.), *Science for conservators. Volume 1: An introduction to materials*, 1983

1.13. Curatorship and Museology

Category: A

Type: optional

Extent of the course: 8 lectures + 5 seminars

ECTS: 3

Recommended year / semester: 1 / 1

This course provides students with an in-depth, multi-perspective exploration of the methods and contemporary issues in curatorship and museology, both in terms of its practical management and the broader cultural discourse surrounding it. Special emphasis is placed on the role of the museum as disseminator of complex historical and cultural data.

Student learning outcome: the course offers students insight into the historical, conservation, management and theory-oriented problems they will encounter, training them to become a critical



curator, capable of successful evaluation and communication of the exhibit information and its wider place in the cultural discourse.

Assessing methods: continuous assessment

Bibliography:

Compulsory

J. Berger, *Ways of Seeing*, 1972

V. Newhouse, *Towards a New Museum*. Expanded Edition, 2007

J. Putnam, *Art and Artifact: The Museum as Medium*, 2001

Recommended

J. Marstine (ed.), *New Museum Theory and Practice: An Introduction*, 2008

1.14. Databases and GIS in archaeological heritage management

Category: A

Type: compulsory

Extent of the course: 10 lectures + 4 seminars + 12 participatory exercises

ECTS: 5

Recommended year / semester: 1 / 2

The course will focus on knowledge representation for digital heritage. As the data (of various types and sources) is permanently evolving in size and aims, the concepts of ontologies, graph databases (or triple stores), and semantic interoperability are central. Scalability and coherency, adaptability and robustness are important keys of a IT project. Symbolic artificial intelligence, namely knowledge engineering through Semantic Web languages, can help in heterogeneous data processing and understanding.

Student learning outcome: by the end of the course, students are expected to be familiar with knowledge representation with languages such as RFD Schema and OWL, graph databases and graph data querying, along with rule definition and reasoning. They would also conceive ontologies and populate them with structured and unstructured data and enable reasoning.

Assessing methods: mandatory attendance, written exam

Bibliography:

Compulsory

<https://www.w3.org/OWL/>

<https://www.w3.org/TR/sparql11-query/>



Recommended

F. Baader, I. Horrocks, C. Lutz, U. Sattler, *An Introduction to Description Logic*, 2017.
<https://www.cs.ox.ac.uk/people/ian.horrocks/dlbook/about.html>

Study aids

Protégé ontology editor <https://protege.stanford.edu/>

1.15. Digitization 2D and 3D and sensors

Category: M

Type: optional

Extent of the course: 7 lectures + 6 seminars

ECTS: 3

Recommended year / semester: 2 / 1

The course aims at introducing the students to the methodologies and constraints of artifacts digitization, where both the technical aspects of the extraction of a numerical representation and the shape of the object to be acquired must be handled with care. Examples will be taken in common data sets and a report describing the choice of the sensors, the digitization phase, the processing step and the analysis of the resulting 3D object will be constructed. Students will have to choose representative elements and pursue a complete process.

Student learning outcome: students will have to choose representative elements and pursue a complete process of digitization, focusing on the possible usages of their items. They will be able to explain their methodologies, the choice of the sensors according to planned usage. They will need to discuss on accuracy versus data sizes, types of sensors compared to surface material, roughness, expected resolution. The sum of their reflexions will be structured in a final report.

Assessing methods: attendance to the seminars, report on various digitization of artefacts

Bibliography:

G. Confalone, J. Smits, T. Kinnare, *3D Scanning for Advanced Manufacturing, Design, and Construction*, 2023

Digital Research and Education in Architectural Heritage. 5th Conference, DECH 2017, and First Workshop, UHDL 2017, Dresden, Germany, March 30-31, 2017. Revised Selected Papers, 2018

1.16. Elaboration and Discussion of Master Thesis

Category: P

Type: mandatory

ECTS: 15



Recommended year / semester: 2 / 2

The thesis defense is a comprehensive verification of the ability to elaborate in written work on a given topic in a systematic and independent way, and to apply knowledge and skills acquired in the field given field of study.

Student learning outcome: through successful completion and defense of the Master Thesis, students will prove ability to analyse independently a selected topic within the broader field of archaeological heritage, and to convey their knowledge and express their ideas in written and oral form.

Assessing methods: permanent evaluation, thesis defense

1.17. Ethical aspects of heritage management

Category: M

Type: optional

Extent of the course: 13 lectures

Hours: 13

ECTS: 3

Recommended year / semester: 2 / 2

The course explores the ethical dimensions of cultural heritage management, with a focus on the responsibilities of heritage professionals, communities, and governments. Students will critically engage with the ethical challenges that arise in preserving, interpreting, and managing heritage, especially in multicultural and post-colonial contexts. Topics include the repatriation of artifacts, cultural rights, heritage in conflict zones, and the impact of tourism.

Student learning outcome: the students will be able to understand key ethical issues in the management and preservation of cultural heritage, to gain insight into the ethical responsibilities of heritage professionals and to evaluate real-world case studies related to cultural heritage management.

Assessing methods: written exam (essay)

Bibliography:

Compulsory

UNESCO. World Heritage Centre. World Heritage Convention (<https://whc.unesco.org/>)

ICOMOS International Ethical Guidelines (<https://www.icomos.org/en/>)

Recommended

J. Blake, *International Cultural Heritage Law*, 2015

F. Cameron, S. Kenderdine (Eds.), *Theorizing Digital Cultural Heritage: A Critical Discourse*, 2007



L. Meskell, *A Future in Ruins: UNESCO, World Heritage, and the Dream of Peace*, 2018

1.18. European Prehistory

Category: B

Type: compulsory

Extent of the course: 13 lectures

ECTS: 3

Recommended year / semester: 2 / 1

The course aims to introduce the students to the main developments in the history of material culture and to the main typologies of archaeological sites in Europe. The course covers the period between the first human settlements in Europe and the beginning of the pre-Roman Iron Age.

Student learning outcome: by the end of the course students are expected to be familiar with the main typologies of archaeological structures and with the main elements of material culture in European Prehistory.

Assessing methods: written exam

Bibliography:

- L. R. Binford, Willow Smoke and Dogs' Tails: Hunter-Gatherer Settlement Systems and Archaeological Site Formation, *American Antiquity* 45/1 (1980)
- F. Bordes, *Typologie du Paléolithique ancien et moyen*, 1961
- G. Clark, *Prehistoric Europe: The Economic Basis*, 1952
- C. Gamble, *The Palaeolithic Societies of Europe*, 1999
- M.-L. Inizan, M. Reduron-Ballinger, H. Roche, J. Tixier, *Technology of Knapped Stone*, 1999
- L. Nilsson Stutz, R. Peyroteo Stjerna, M. Törv (Eds.), *The Oxford Handbook of Mesolithic Europe*, 2025

1.19. Fieldwork I: archaeological excavation I

Category: P

Type: compulsory

Extent of the course: 10 days on the field + 1 seminar

ECTS: 3

Recommended year / semester: 2 / 1



The course aims at providing an introduction to archaeological fieldwork, including survey, excavation and documentation of both underground and standing structures and monuments.

Student learning outcome: by the end of the course, the student is expected to understand the main aspects of field excavation and documentation.

Assessing methods: permanent evaluation

1.20. Fieldwork II, modality 1: archaeological excavation II

Category: P

Type: optional

Extent of the course: 10 days on the field + 1 seminar

ECTS: 3

Recommended year / semester: 2 / 2

The course aims at providing skills related to post-excavation duties and advanced experience in archaeological fieldwork, where the student will assume direct responsibilities in the excavation and documentation process.

Student learning outcome: by the end of the course, the student is expected to master all the aspects of field excavation, documentation and coordination, as well as of the post-excavation management of newly recorded archaeological structures and artefacts.

Assessing methods: permanent evaluation

1.21. Fieldwork II, modality 2: landscape research

Category: P

Type: optional

Extent of the course: 10 days on the field + 1 seminar

ECTS: 3

Recommended year / semester: 2 / 2

The course aims at providing an experience in overarching, pluridisciplinary study of historical landscapes, where the student will participate in the excavation and documentation of both underground and standing archaeological structures and learn how to connect them to the history of the surrounding landscape.



Student learning outcome: by the end of the course, students will be acquainted with the practical aspects of an integrated study of complex historical landscapes.

Assessing methods: permanent evaluation

1.22. Financial management

Category: A

Type: compulsory

Extent of the course: 13 lectures

ECTS: 3

Recommended year / semester: 2 / 1

The course aims at providing the students with a working understanding of the financial management of a public or private organisation managing archaeological heritage, including the implications of conflicts of interests, public offerings and rights issues; the principles of capital structure decisions; the implications of taxation; strategies of appraisal and development of an organisation's funding policies; analysis of capital markets and sources of funding.

Student learning outcome: upon completion of the course, the students will be able to describe and analyse the different financing possibilities; to understand and analyse the financial status of a heritage organization; to evaluate the practical role of financial management in heritage organizations; to apply and make valid short-term and long-term financial decisions; and to choose and manage the appropriate sources of funding.

Assessing methods: written exam

Bibliography:

J. C. Van Horne, J. M. Wachowicz Jr., *Fundamentals of Financial Management*, 2007

D. Adams, *Management Accounting for Hospitality, Tourism, And Leisure Industries: A Strategic Approach*, 2006

1.23. Generative AI for 3D

Category: M

Type: optional

Extent of the course: 4 lectures + 3 seminars + 6 participatory seminars

ECTS: 3

Recommended year / semester: 2 / 2



This course covers the various processes used to render 3D digital data to make it easier to interpret and analyze. Data can be rendered on a screen using photorealistic or non-photorealistic rendering techniques to highlight specific properties. We will discuss rendering using virtual reality for simple objects, buildings, and even archaeological sites. We will present techniques for enriching environments (AI-generated scenery or populated with autonomous characters) to increase the feeling of immersion. Finally, we will present the different methods of 3D printing to make digital data tangible.

Student learning outcome: at the end of this course, students will be able to choose from different solutions for rendering 3D data in immaterial form via VR or in material form via 3D printing. They will understand the complexity involved in implementing a 3D data rendering solution, and be able to choose a rendering technique based on the objectives and constraints of a project.

Assessing methods: written exam (essay)

Bibliography:

- X. Li, Q. Zhang, D. Kang, W. Cheng, Y. Gao, J. Zhang, Z. Liang, J. Liao, Y. Cao, Y. Shan, *Advances in 3D Generation: A Survey*, 2024
Z. Lyu, *Applications of Generative AI*, 2024. DOI 10.1007/978-3-031-46238-2
D. Alma, *GAN architectures for 3D Models*, 2022

1.24. Introduction to Archaeology

Category: B

Type: compulsory

Extent of the course: 13 lectures

ECTS: 3

Recommended year / semester: 1 / 1

This course provides a structured introduction to modern archaeological thought and the key debates that shape how archaeologists interpret material evidence. It frames archaeology as a historical and social science that works with incomplete records, and it surveys major theoretical and methodological approaches – from culture-historical and processual perspectives to interpretive, post-processual, practice-based, materiality-focused, postcolonial, and indigenous approaches.

Throughout the course, students will learn how archaeological interpretations are produced, argued, and evaluated, and how archaeology interacts with cognate disciplines such as history, anthropology, sociology, geography, and heritage studies. Special attention is paid to the relationship between data, theory, and narrative, the politics and ethics of archaeological knowledge, and the contemporary role of archaeology in society.

Student learning outcome: by the end of the course, the student will be able to describe the major theoretical traditions in archaeology and the questions they prioritise; to explain how different



approaches influence interpretation; to critically assess archaeological arguments (basic logic of inference, evidence, analogy, and uncertainty); to recognise the value and limits of interdisciplinary collaboration and communicate archaeological reasoning to partner fields; and to articulate ethical and societal dimensions of archaeological heritage.

Assessing methods: written exam

Bibliography:

- R. A. Bentley, H. D. G. Maschner, C. Chippindale (Eds.), *Handbook of Archaeological Theories*, 2008
I. Hodder (Ed.), *Archaeological Theory Today* (2nd Edition), 2012
I. Hodder, S. Hutson, *Reading the Past: Current Approaches to Interpretation in Archaeology* (3rd Edition), 2003
M. Johnson, *Archaeological Theory: An Introduction* (2nd Edition), 2010
C. Renfrew, P. Bahn, *Archaeology: Theories, Methods and Practice*, 2020
B. G. Trigger, *A History of Archaeological Thought* (2nd Edition), 2006

1.25. Introduction to History of Art and Architecture (Antiquity to Early Modern Period)

Category: B

Type: compulsory

Extent of the course: 18 lectures + 8 seminars

ECTS: 6

Recommended year / semester: 1 / 1

This course provides an introductory survey of the major developments in art history, focusing on the period from prehistory to the modern era, ending around the late 19th century. Students will examine significant artistic movements, styles, and cultural contexts that shaped the creation of art. The course spans from prehistoric cave paintings to the artistic innovations of the 19th century, emphasizing how artistic forms and functions evolved in response to social, religious, and political changes. The course offers interdisciplinary look at art from a variety of perspectives: historical, material, cultural and ideological.

Student learning outcome: students will develop skills to critically analyse visual art and understand its role within historical narratives. The course aims at allowing students a critical approach to the preserved anthropogenic elements of the cultural landscape.

Assessing methods: continuous assessment + final project

Bibliography:

Compulsory

- A. Augenti (ed.), *Art and Archaeology of Rome: From Ancient Times to the Baroque*, 2000



- J. Beckwith, *Early Medieval Art*, 1964
J. Berger, *Ways of Seeing*, 1972
J. Summeron, *The Classical Language of Architecture*, 1965
F. D. K. Ching, M. M. Jarzombek, V. Prakash, *A Global History of Architecture*, 2010
H.W. Janson, *History of Art*, 1962
G. Waddell, *Greek and Roman Architecture (Classic Architecture)*, Volume 1, 2017
G. R. H. Wright, *Ancient Building Technology*, Volume 3: Construction, 2009

Recommended

- G. Vasari: *Lives of the Artists*
U. Eco, *Art and Beauty in the Middle Ages*, 1986
Vitruvius: *The Ten Books on Architecture*

1.26. Introduction to IT tools in Archaeological Heritage

Category: B

Type: compulsory

Extent of the course: 5 lectures + 5 seminars + 3 participatory exercises

ECTS: 3

Recommended year / semester: 1 / 1

The course is an introduction to computer science capabilities, from theoretical concepts (algorithm, information theory, data science) to practical usages (program, types, database, network protocols and operating systems). It will as well focus on data management, with the help on databases, data sciences and scientific computing. The collected data from an archaeological project is of various types and formats. They need first to be understood, then aggregated in a common relational scheme, before to be processed and analysed. The design of an efficient conceptual data model will be explained before building the practical implementation. Once the data sets are ready to process, using a scientific computation environment (as in R language) permits data analysis and constructive feedback.

Student learning outcome: by the end of the course, students are expected to be familiar with the structure of a procedural, object-oriented program (in Python), transportation and content of a web page (HTML, services and ports), storage of items in a relational database (SQL). They are able to understand the functional design of an application. They should be familiar with data management, data structures and data processing in a scientific computing system. They will be able to construct data reports and analytical examinations.

Assessing methods: mandatory attendance, written exam and technical steps milestones

Bibliography:

Compulsory

R for graduate student https://bookdown.org/yih_huynh/Guide-to-R-Book/



Recommended

- C. Fehily, *SQL Short Course (Database Programming)*, 2014
- M. J. Johnson, *A Concise Introduction to Programming in Python*, 2018
- N. Matloff, *Probability and Statistics for Data Science: Math + R + Data* (1st Edition), 2019
- P. Bruce, A. Bruce, P. Gedeck, *Practical Statistics for Data Scientists: 50+ Essential Concepts Using R and Python*, 2017
- L. Gallardo, *Mastering Data Analysis with Python, R, and SQL: From Statistical Foundations to Artificial Intelligence*, 2024

Study aids

R studio, SQL database, online python environment

1.27. Laboratory work

Category: P

Type: optional

Extent of the course: 5 days of lab practice

ECTS: 2

Recommended year / semester: 1 / 1

In this seminar, students gain hands-on experience with the processing, documentation, and cataloguing of archaeological finds. Work focuses primarily on ceramics, while also introducing other common material categories such as daub, animal bone, metal artefacts, and related assemblages. The course guides students through the basic workflow of post-excavation practice—from initial handling and identification to recording, conservation principles, and appropriate storage. Emphasis is placed on understanding how laboratory procedures contribute to the overall interpretation and long-term preservation of excavation results.

Student learning outcome: upon successful completion of the course, students will have developed practical skills in handling and processing archaeological finds, including basic documentation and inventory methods. Students will understand best practices for the treatment of finds both in the field and in the laboratory, including safe handling, cleaning and stabilisation principles, and storage requirements. They will also be able to recognise common mistakes and risks (e.g., inappropriate cleaning or packaging) and explain how to avoid them to prevent damage and loss of information.

Assessing methods: permanent evaluation

1.28. Landscape and Environmental Archaeology

Category: M

Type: optional



Extent of the course: 13 lectures

ECTS: 3

Recommended year / semester: 2 / 2

The course aims to introduce the students to the principles and methodologies of landscape archaeology, with a special focus on the application of geographical and geoarchaeological methods to the reconstruction of historical landscapes.

Student learning outcome: by the end of the course, students should understand the main topics and concepts in human - environment interaction and partnership. Students should be able to evaluate research findings in the appropriate context of theory and current research and to plan the application of modern research methods on selected research topics.

Assessing methods: written exam

Bibliography:

- W. Ashmore, A. B. Knapp (Eds.), *Archaeologies of Landscape: Contemporary Perspectives*, 1999.
K. W. Butzer, *Archaeology as human ecology. Method and theory for a contextual approach*, 1981
C. L. Crumley, T. Lennartsson, A. Westin (Eds.), *Issues and Concepts in Historical Ecology: The Past and Future of Landscapes and Regions*, 2018
D. F. Dincauze, *Environmental Archaeology. Principles and practice*, 2000
J. G. Evans, T. O`Connor, *Environmental Archaeology. Principles and Methods*, 2005
J. McNeill, V. Winiwarter, *Soils and Societies. Perspectives from Environmental History*, 2010
C. L. Redman, *Human Impact on Ancient Environments*, 1999
E. Reitz, M. Shackley, *Environmental Archaeology*, 2012

1.29. Norms and standard for BIM and GIS

Category: M

Type: optional

Extent of the course: 6 lectures + 3 seminars + 4 participatory seminars

ECTS: 3

Recommended year / semester: 2 / 2

The course will introduce the students to the methodologies and standards in building description. It will cover contemporary BIM (Building information modeling) from an information system point of view. It will then address H(Heritage) BIM and the limits of ancient building description facing to archaeological rules. Building environment, such as landscape, GIS, resources will also be explaining in a standardization way. Interoperability will be the major point of the course.

Student learning outcome: by the end of the course, students will be able to understand and complete a project requirements' document on architectural, landscape, city information system,



centered on interoperability. The discussion about the integration on cultural heritage in such contemporary description will also be a reflect a new line of thinking on the relation between IT and archaeology.

Assessing methods: mandatory attendance, written exam

Bibliography:

Y. Arayici, J. Counsell, L. Mahdjoubi, G. Nagy, S. Hawas, K. Dweidar, *Heritage Building Information Modelling*, 2017.

R. Sacks, C. Eastman, G. Lee, P. Teicholz, *A Guide to Building Information Modeling for Owners, Designers, Engineers, Contractors, and Facility Managers*, 2018

Reading material on <https://www.buildingsmart.org/> and <https://www.ogc.org/>

1.30. Participatory Approaches to Heritage Management

Category: A

Type: optional

Extent of the course: 4 lectures + 9 participatory exercises

ECTS: 3

Recommended year / semester: 2 / 2

The course gives students hands-on experience on participatory approaches in heritage management. During the course students learn different participatory approaches and methods which they use on case studies. It teaches students to analyze heritage projects that successfully integrate community participation and sustainability (on global examples like UNESCO sites and local projects) and develop their own projects while working in groups. The aim of the course is to encourage students to identify problems and propose solutions, drawing from their knowledge of cultural heritage management, and to enhance their teamwork skills while developing propositions for sustainable archaeological heritage management on chosen examples.

Student learning outcome: students will be able to understand the perspectives of various stakeholders and local communities, to develop participatory process on local community level for chosen case study and to give recommendations for implementation of sustainable archaeological heritage management.

Assessing methods: project-based assessments

Bibliography:

Compulsory

European Commission: Cultural Heritage. <https://culture.ec.europa.eu/cultural-heritage>

UNESCO. World Heritage Centre. World Heritage Convention. <https://whc.unesco.org/en/sdci/>

E. Waterton, S. Watson, *The Palgrave Handbook of Contemporary Heritage Research*, 2013



Optional

A. Bryman, *Social Research Methods*, 2012

D. Giglito, L. Ciolfi, E. Lockley, E. Kaldeli, *Digital Approaches to Inclusion and Participation in Cultural Heritage Insights from Research and Practice in Europe*, 2023

M. Taloni (Ed.), *Archaeological Heritage Management. Processes and Models for Comparison Across Europe and Beyond*, 2025

1.31. Problem of Form and Function in Settlements and Architecture (Antiquity to Early Modern Period)

Category: M

Type: optional

Extent of the course: 18 lectures + 8 seminars

ECTS: 5

Recommended year / semester: 2 / 1

The course explores the relationship between the form and function in the architecture from Classical Antiquity to the Early Modern Period through a number of select case studies chosen from the area of the (Post) Roman Empire. Course takes into consideration various forms of architecture, from residential to sacral, and gives students an insight how the role it had to play in a given society was reflected in its form. The course looks at the architectural heritage from the anthropocentric perspective, exploring the societal and cultural role it had for those who had used it, offering a broader look than the study of pure form.

Student learning outcome: the course gives students an insight on the role that various forms of architecture, from residential to sacral, played in a given society, and how it conditioned in its form.

Assessing methods: continuous assessment

Bibliography:

Compulsory

F. Ching, *Architecture, Form, Space & Order*, 1979

R. Krautheimer, *Early Christian and Byzantine Architecture*, 1986

S. P. Ellis, Power, "Architecture and Decor: How the Late Roman Aristocrat Appeared to His Guests", *Roman art in the private sphere. New perspectives on the architecture and decor of the domus, villa, and insula*, 1991

A. Erlande-Brandenburg, *The Cathedral: The Social and Architectural Dynamics of Construction*, 2009

Recommended

C. Heitz, *L'architecture religieuse carolingienne – les formes et leurs fonctions*, 1980

E. Palazzo, J.P. Caillet, D. Gaborit-Chopin, *L'Europe de l'an mil*, 2001



1.32. Public Policies and Legal Regulations

Category: M

Type: compulsory

Extent of the course: 7 lectures + 6 seminars

ECTS: 3

Recommended year / semester: 1 / 1

The course aims at providing a general framework of European regulations as well as selected aspects and case examples from the countries with different historical backgrounds, archaeological heritages and landscapes.

Student learning outcome: at the end of the course, students will have a European-wide perspective on heritage legal regulations and be aware of the main national particularities between European countries; students will learn how to apply this theoretical knowledge to different sorts of projects involving archaeological heritage

Assessing methods: attendance to the seminars, written exam

Bibliography:

Council of Europe: European Convention on the Protection of the Archaeological Heritage. <https://www.coe.int/en/web/conventions/full-list?module=treaty-detail&treatynum=143>
European Commission: Cultural Heritage. <https://culture.ec.europa.eu/cultural-heritage>
UNESCO, World Heritage Centre: World Heritage Convention. <https://whc.unesco.org/en/sdci/>
M. Taloni (Ed.), *Archaeological Heritage Management. Processes and Models for Comparison Across Europe and Beyond*, 2025

1.33. Spatial Analysis

Category: M

Type: optional

Extent of the course: 8 lectures + 5 participatory exercises

ECTS: 3

Recommended year / semester: 2 / 1

The course objectives are to expose geo-referenced data, geographic systems and their management. Data are of various types: homogeneous discrete grids in surfaces or volumes, vectorial description, point clouds with no topological relations, regular databases and so on. They are embedded into referencing systems, the latter imply transformations between geometric spaces



in order to process data. Once the students are comfortable with data, they can move forward to spatial analysis, combining data with operations and constraints.

Student learning outcome: by the end of the course, students are expected to manipulate spatial data of various types, project them in a work space, use these aggregated data to provide a rigorous analysis. They are also expected to identify their needs in a geospatial setup for all data in their project.

Assessing methods: mandatory attendance, written exam

Bibliography:

Recommended

S. Shekhar, H. Xiong, X. Zhou (Eds.), *Encyclopedia of GIS*, 2017.
<https://link.springer.com/referencework/10.1007/978-3-319-17885-1>

Study aids

<https://www.ogc.org/publications/>

<https://opengeospatial.github.io/e-learning/index.html>

1.34. Statistics and Data Processing

Category: M

Type: optional

Extent of the course: 5 lectures + 5 seminars + 3 participatory seminars

ECTS: 3

Recommended year / semester: 1 / 1

This course lays the foundations for statistical analysis: descriptive statistics, statistical inference (estimation theory and hypothesis testing), and data analysis methods. We will review basic terminology and concepts. The different data types (statistical variables) will be introduced, along with the associated tools. We will introduce the primary methods of data analysis and time series analysis. We will give examples of applications to shape analysis (geometry, surface roughness, porosity).

Student learning outcome: at the end of this course, students will be able to identify the type of statistical tools appropriate for answering scientific questions (conditions of use, advantages, and limitations). They will be able to determine the measures, studies, or surveys to be implemented for data collection and to define a data collection plan based on the analyses. They will be able to apply standard statistical tools and to present the results in an objective manner.

Assessing methods: written exam (essay)



Bibliography:

D. Lane, *Introduction to Statistics*, 2013

M. H. Herzog, G. Francis, A. Clarke, *Understanding Statistics and Experimental Design*, 2019

1.35. Theory and History of Landscape Research

Category: B

Type: compulsory

Extent of the course: 14 lectures + 12 seminars

ECTS: 5

Recommended year / semester: 1 / 1

The course offers an overview of the development of the historical concept of landscape, and its subsequent incorporation into the historical sciences, but also in the current discourse surrounding the museology. Course explores the landscape as holistic concept, following its understanding because of human-nature interaction in the long duration. It also focuses on social, cultural and environmental potentials and challenges for sustainable landscape management and preservation.

Student learning outcome: the students will learn to compare types of landscape and their main features from different perspectives, to analyze sustainable landscape management and preservation challenges and potentials and to use landscape framework in archaeological heritage research and management.

Assessing methods: continuous assessment

Bibliography:

Compulsory

T. Ingold, The Temporality of the Landscape, *World Archaeology* 25/2 (1993)

M. Antrop, V. V. Eetvelde, *Landscape Perspectives the Holistic Nature of Landscape*, 2017

Recommended

J. K. Birksted, Landscape History and Theory: from Subject Matter to Analytic Tool, *Landscape Review* 8/2 (2004)

1.36. Traineeship

Category: P

Type: mandatory



Extent of the course: four working weeks

ECTS: 6

Recommended year / semester: 2 / 2

The internships are designed to provide the students an opportunity to acquire first-hand knowledge on the strategies, activities and management of an organisation operating in the field of archaeological heritage. This experience is expected to be a first contact with the professional sector and an opportunity to apply and expand the skills and knowledge acquired during the completion of the master study.

Student learning outcome: by the end of the traineeship, the students will have a first experience in the professional management of archaeological heritage and consolidate the knowledge and skills learnt during the master study by means of their direct application in a work environment.

Assessing methods: permanent evaluation, final report

1.37. Urban Archaeology

Category: M

Type: optional

Extent of the course: 7 lectures + 6 seminars

ECTS: 3

Recommended year / semester: 2 / 2

The course aims at introducing the students to the methodologies and strategies of archaeological excavation in urban environments, where the specific problems of altered stratigraphies, topographical constraints and presence of both underground and standing structures typical in European cities will be analysed from a problem-solving viewpoint.

Student learning outcome: by the end of the course, students will have all the theoretical knowledge required to plan archaeological researches in complex urban environments.

Assessing methods: compulsory attendance to the seminars, written exam

Bibliography:

- S. Baugher, D. R. Appler, W. Moss (Eds.), *Urban Archaeology, Municipal Government and Local Planning. Preserving Heritage within the Commonwealth of Nations and the United States*, 2017
- P. Belford & J. Bouwmeester (Eds.), *Managing Archaeology in Dynamic Urban Centres*, 2020
- J. Coulston, H. Dodge, *Ancient Rome: The Archaeology of the Eternal City*, 2000

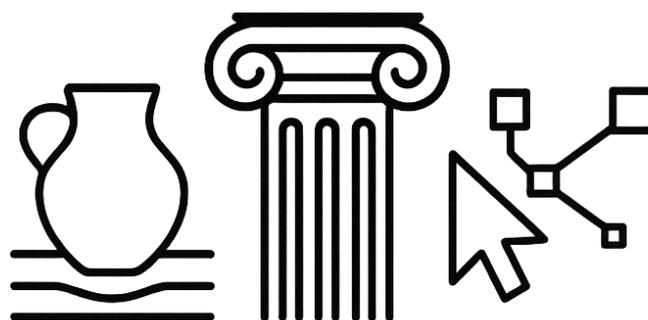


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