

**Bioarchaeology**

Code: 100714  
ECTS Credits: 6

Degree	Type	Year	Semester
2500241 Archaeology	OB	3	1

**Contact**

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**Use of Languages**

Principal working language: catalan (cat)  
Some groups entirely in English: No  
Some groups entirely in Catalan: Yes  
Some groups entirely in Spanish: No

**Teachers**

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Cristina Rihuete Herrada

**Prerequisites**

The course "Introduction to Archeology" should have been taken previously.

**Objectives and Contextualisation**

The course is part of the subject area "Field and Laboratory Methods and Techniques" of the degree in Archaeology. There are 36 ECTS of compulsory courses related to this subject area (Methods and field techniques in prehistoric archaeology, Methods and techniques in historical archaeology, Analysis of artifacts, Analysis and study of archaeological materials, Bioarchaeology and Quantitative Archaeology) aiming at providing basic knowledge on methodology and field and laboratory techniques in archaeology.

The Bioarchaeology course emphasizes those methods and techniques associated with archaeozoological, archaeobotanical and ancient human remains. The methods for describing and analysing the variability of the data are presented, introducing aspects such as the testing of statistical hypotheses or the analysis of qualitative and quantitative relationships. The contents of this subject are aimed at giving students the basic tools that are necessary in order to deal with archaeological materials as a category of historical documents.

The course relies in practical training and is designed to provide a problem-oriented approach with the help of practical sessions in the teaching lab.

## Competences

- Carrying out and managing archaeology fieldwork: excavation and survey.
- Generating innovative and competitive proposals in research and professional activity.
- Managing the main methods, techniques and analytic tools in archaeology.
- Respecting the diversity and plurality of ideas, people and situations.
- Students must be capable of applying their knowledge to their work or vocation in a professional way and they should have building arguments and problem resolution skills within their area of study.
- Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.
- Students must develop the necessary learning skills to undertake further training with a high degree of autonomy.

## Learning Outcomes

1. Applying both knowledge and analytical skills to the resolution of problems related to their area of study.
2. Applying implementing protocols of fieldwork and sample collection.
3. Applying proper techniques and analytical tools in case studies.
4. Combining technical resources from similar disciplines.
5. Establishing investigation protocols for original research projects.
6. Interpreting the archaeological fieldwork results by placing them into their historical context.
7. Mastering specific techniques and instrumental resources of archaeological laboratory analysis.
8. Organizing their own time and work resources: designing plans with priorities of objectives, calendars and action commitments.
9. Recognising and implementing the following teamwork skills: commitment to teamwork, habit of cooperation, ability to participate in the problem solving processes.
10. Recognising the importance of controlling the quality of the work's results and its presentation.
11. Submitting works in accordance with both individual and small group demands and personal styles.
12. Transmitting the results of archaeological research and clearly communicating conclusions in oral and written form to both specialised and non-specialised audiences.
13. Using computing tools, both basics (word processor or databases, for example) and specialised software needed in the professional practice of archaeology.
14. Using the specific interpretational and technical vocabulary of the discipline.

## Content

### Contents

#### Block 1.- Archaeobotany

- Nature and specificity of archaeobotanical remains
- Formation of the archaeobotanical record.
- Methods and techniques for recovering botanical remains
- The determination of archaeobotanical remains
- Seed and fruit remains: food resources and products, processing and consumption
- Anthracology and dendrology: the management of forest resources
- Palynology: the vegetal landscape

#### Block 2.- Archaeozoology

- Fauna analysis in the framework of archaeological research projects. Goals, trends and key concepts in archaeozoology. Integrating archaeozoological problems to archaeological research.

- The nature of the paleofaunistic record. Micromammals, fish, molluscs and birds. Other categories of remains: amphibians, reptiles, insects and mites
- The formation of fauna remains: archaeotaphonomy. The incorporation of animal remains to the archaeological sites: agents and conditions. Archaeotaphonomy assessment.
- The recovery of fauna remains: units and conditions. Representativeness of faunal assemblages: the problem of sampling.
- Anatomical and taxonomic classification of fauna remains. The reference collection. The handbooks. Problems with the determination of morphologically close species. Biometry. DNA. Categories and classification units used in archeozoology. Databases and recording methods.
- Determination of the structure of the slaughtered animal populations. The estimation of age: tooth wear and epiphyseal closure assessment. X-rays. Sex determination. Morphology and osteometric criteria.
- Anthropic modifications. Traces linked to processing, distribution and consumption of animal resources. Identification of work processes through the analysis of changes in bone surfaces. Techniques involved in the preparation of food for consumption: identification and characterization based on the analysis of thermal alterations. Analysis of fracture patterns and their relationship with the processing and consumption of animals and animal products.
- The spatial analysis of fauna remains. Bone breakage, refitting and anatomical articulations.
- Quantification and statistical treatment. Sample representativity. Number of remains and minimum number of individuals. Skeletal parts frequencies. Evaluation of potentially supplied biomass.
- The interpretation: management of animal resources. Different trends in Archaeozoology.

#### Block 3.- Human Osteoarchaeology (anthropology)

- Bone tissues, anatomical standards, human variability and osteological determination.
- Human bones of the axial skeleton
- Human bones of the appendicular skeleton
- Principles of demographic analysis (1): age-at-death estimation.
- Principles of demographic analysis (2): sex estimation.
- Tomb excavation & record: orientation, position, sequencing and funerary taphonomy.
- Human bones in funerary practices research.

### **Methodology**

The course is of a practical nature and it will be taught in the teaching laboratories of the Department of Prehistory.

Basic procedures for the analysis of archaeological remains will be learned by means of case study applications and practical exercises.

Distribution of hours per block:

- Archaeozoology: 21 hours
- Archaeobotany: 21 hours
- Anthropology: 12 hours

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

## Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Practical sessions	50	2	3, 2, 4, 7
Type: Supervised			
Exercices based on ICT	15	0.6	3, 1
Type: Autonomous			
Written assignment	80	3.2	3, 1, 6, 8, 11, 10, 12, 14, 13

## Assessment

Attendance to practical classes is compulsory; exercises and practical work will be required for each one of the three blocks.

Written tests will also be required for some of the contents of the course.

Weighting evaluation activities:

Archaeobotany: delivery of practical exercises 24% (4 deliveries, each represents 6%), final written test 16%

Archaeozoology: delivery of practical exercises 20%, final written test 20%

Anthropology: delivery of practical exercise 20%

Re-evaluation:

A second evaluation is foreseen for those students not having passed the first one if the following requirements are met:

- All tests for each one of the three blocks must have been taken.
- All practical sessions must have been attended.

At the time of completion/delivery of each assessment activity, the teacher will inform (Moodle, SIA) of the procedure and date of revision of the grades.

The student will be classified as Non-evaluable when he has not delivered more than 30% of the evaluation activities.

In the event of a student committing any irregularity that may lead to a significant variation in the grade awarded to an assessment activity, the student will be given a zero for this activity, regardless of any disciplinary process that may take place. In the event of several irregularities in assessment activities of the same subject, the student will be given a zero as the final grade for this subject.

## Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Delivery of practical exercises	64%	3	0.12	3, 2, 1, 4, 7, 6, 8, 11, 10, 12, 14, 13
Exams	36%	2	0.08	5, 11, 9, 12, 14

## Bibliography

### Bloc 1.- Arqueobotànica

#### Manuals i obres generals:

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BUXÓ, R.; PIQUÉ, R. (dir.) 2003 La recogida de muestras en arqueobotánica: objetivos y propuestas metodológicas. Museu d'Arqueologia de Catalunya, Barcelona, 71 pp.

BUXÓ, Ramon.; PIQUÉ, Raquel. 2008. Arqueobotànica. Los usos de las plantas en la Península Ibérica. Barcelona: Ariel

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MARTÍN SEIJO, María; RICO REY, Aldara; TEIRA BRIÓN, Andrés, PICÓN PLATAS, GARCÍA GONZÁLEZ, Israel Ignacio; ABAD VIDAL Emilio 2010. Guía de Arqueobotánica. Xunta de Galicia. Consellería de Cultura e Turismo Dirección Xeral do Patrimonio Cultural. [Guia\\_de\\_Arqueobotanica.pdf \(cultura.gal\)](#)

PEARSALL, Deborah M. 2015. Paleoethnobotany. A handbook of procedures (3rd ed.). Walnut Creek, CA: Left Coast Press.

VAN ZEIST, W.; WASYLIKOWA, K. i BERHE, K.E. 1991 *Progres in Old World Palaeoethnobotany*. Rotterdam: Balkema.

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ANTOLÍN, Ferran 2016.: Local, intensive and diverse? Early farmers and plant economy in the North-East of the Iberian Peninsula (5500-2300 cal BC). Barkhuis, Gröningen.

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<http://seeds.eldoc.ub.rug.nl/>

<http://http://www.plantatlas.eu>

<https://ipna.unibas.ch/archbot/pdf/index.html>

<http://http://insidewood.lib.ncsu.edu>

<http://http://www.wodancharcoal.ie>

BEKKER, R.M., CAPPERS, R. T.J AND NEEF, R. 2011. [Digital Atlas of Economic Plants in Archaeology](#). The Digital Atlas series

Revistes digitals:

*Vegetation History and Archaeobotany*. <https://www.springer.com/journal/334/>

Bloc 2. Arqueozoologia

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TEMA 4. La recuperació de les restes de fauna: unitats i condicions:

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#### USEFUL WEBSITES

Virtual comparative specimens:

<http://vzap.iri.isu.edu/ViewPage.aspx?id=230>

<http://hbs.bishopmuseum.org/frc/types.html>

Zooarch e-mail list:

<http://www.jiscmail.ac.uk/lists/ZOOARCH.html>

Zooarchaeological organizations:

Archeozoo - <http://www.archeozoo.org/en>

International Council for ArchaeoZoology <http://www.alexandriaarchive.org/icaaz/>

Bone Commons (ICAZ) - <http://www.alexandriaarchive.org/bonecommons/>

Sites to buy skeletons and casts:

<http://www.animalskeletons.net/>

<http://www.skullsite.co.uk/lists.htm>

<http://theevolutionstore.com/>

ArchNet: Faunal Resources (Links related to identification of animal remains):

[http://archnet.asu.edu/topical/Selected\\_Topics/Faunal%20&%20Zooarchaeology.php](http://archnet.asu.edu/topical/Selected_Topics/Faunal%20&%20Zooarchaeology.php)

Bioarchaeological References:

<http://www.utep.edu/leb/baref/biblio.htm>

Computerised Bone Templates (presents an approach to the computerized recording of graphical zooarchaeological data using digital image templates and graphic software packages):

<http://www.archaeographica.com>

ICAZ Animal Palaeopathology Working Group:

<http://www.apwg.supanet.com/>

Zooarchaeology Information and Resources:

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Bloc 3.- Osteoarqueologia humana

## 1. Human osteology, physical anthropology, taphonomy and paleopathology

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### 3. Digital resources

TERMCAT Diccionari d'anatomia <https://www.termcat.cat/es/diccionaris-en-linia/182>

The London Atlas of Human Tooth Development - aplicación en línea para la estimación de la edad dental según el protocolo de AlQahtani et al 2010. <http://www.ibossolutions.com/qmul/v3/>

Explorador de anatomía humana Inner Body con sección específica sobre el sistema esquelético <http://www.innerbody.com/image/skelfov.html>

The University of Texas: osteología y anatomía primatológica comparada; incluye vistas 3D y movimiento <http://eskeletons.org/boneviewer/nid/12537/region/skull/bone/cranium>

Estimación del sexo a partir de múltiples marcadores - Software MorphoPASSE <https://www.morphopasse.com/> Exercicis d'osteologia humana - <http://www.free-anatomy-quiz.com/skeletalssystem.html>

Jocs d'osteologia humana Whack-a-Bone - <http://www.anatomyarcade.com/games/WAB/WAB.html>

Osteoware, Smithsonian Institution (2011): software lliure per el registre informatitzat de restes humanes en bases de dades (basat en els Standards de Buikstra i Ubelaker - inclou manual) - <http://osteoware.si.edu/>

Exhumació de fosses de la repressió franquista. Conferència de Francisco Etxeberria (2016) - <https://www.youtube.com/watch?v=c4TEaGDLA8>

Identificació de víctimes de les fosses de la repressió franquista. Conferència de Cristina Rihuete Herrada (Manacor, 3 de maig de 2021) <https://www.youtube.com/watch?v=-rFlim-qz6c>

Mòmies guanches3D - El Museo Canario - Momia nº 20 - <https://sketchfab.com/3d-models/momia-no-20-b11be945cc3249b7bd47fda342b111ea> Momia nº 5 - <https://sketchfab.com/3d-models/momia-no-5-c1a2c18f95644038865f830093f7b28d>

## **Software**

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