Universitat Autònoma de Barcelona

2022/2023

Archaeology, Space and Time: Social Theory and Computational Methods

Code: 44477
ECTS Credits: 6

Degree	Type	Year	Semester
4317545 Prehistoric Archaeology	OB	0	1

Contact

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Use of Languages

Principal working language: spanish (spa)

Other comments on languages

references mostly in english

Teachers

Juan Antonio Barceló Álvarez

Ermengol Gassiot Ballbe

Prerequisites

Students should have a sufficient background in history and archaeology, with previous knowledge of archaeological methodology at the undergraduate level, and some experience in working with archaeological materials. Initial knowledge of cartography and basic statistics is recommended, although not compulsory. Knowledge of mathematics at secondary school level. Computer skills at user level.

Objectives and Contextualisation

This course aims to introduce students to the social theory of archaeological space-time. In addition to the epistemological debate, the methodology of spatio-temporal analysis is presented, with special reference to georeferencing techniques and absolute and relative dating techniques. Different aspects of spatio-temporal analysis are explained, insisting on the construction of social spaces, landscapes and territories, while methodologies and techniques for the construction and analysis of time series are introduced. Students are given access to computer technology for Geographic Information Systems, geostatistics and chronostatistics.

Competences

- Analyse and extract significant scientific information from archaeological materials and from the results of specialist scientific studies.
- Combine findings from different programmes of specialist analysis, identifying any contradictions and drawing conclusions
- Critically analyse a scientific problem area on the basis of specific evidence and documents.
- Design research projects on prehistoric archaeological sites and materials

- Knowledge and understanding that provide a basis or opportunity for originality in developing and / or applying ideas, often in a research context.
- Recognise and judge the social consequences of your own work, taking diversity in gender, identity and culture into account.
- Recognise and use suitable theoretical and methodological concepts for the design, planning and execution of projects on prehistoric archaeological sites and materials.
- Recognise present-day challenges in the study of prehistoric archaeology.
- That students are able to integrate knowledge and handle complexity and formulate judgments based on information that was incomplete or limited, include reflecting on social and ethical responsibilities linked to the application of their knowledge and judgments.
- That the students can apply their knowledge and their ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study.
- Work both individually and in multidisciplinary teams

Learning Outcomes

1. Analyse the practical problems stemming from the application of information technologies for space-temporal analysis in prehistory and archaeology research.
2. Build on the knowledge acquired and apply it to the resolution of problems other than those studied in class.
3. Demonstrate the ability to critically appraise scientific explanations in archaeology, based on analytic results.
4. Demonstrate the ability to integrate into a team with specialists from other disciplines.
5. Demonstrate the ability to synthesise and integrate data in a scientific project.
6. Demonstrate the efficacy of information technologies for space-temporal analysis in solving problems in archaeology.
7. Evaluate the real potential for influencing the public through cultural action.
8. Evaluate the results of spatial and temporal analyses to explain social action in prehistory.
9. Identify the areas in which spatial analysis of archaeological data can be applied when studying prehistory, and the specific need for georeferenced data and cartographies.
10. Identify the areas in which temporal analysis of archaeological data can be applied when studying prehistory, and the specific need for absolute and relative dating.
11. Include gender perspectives, universal accessibility and multiculturalism when proposing and reflecting on work.
12. Incorporate ethical considerations into the analysis of the cultural needs of different groups.
13. Incorporate the conceptual foundations of space-temporal analysis into the design of a research project in prehistoric archaeology.
14. Knowledge and understanding that provide a basis or opportunity for originality in developing and / or applying ideas, often in a research context.
15. Make use of spatial analysis techniques to solve problems in archaeology.
16. Make use of temporal and chronological analysis techniques to solve problems in archaeology.
17. Review the general foundations of the technologies of space-temporal analysis.
18. Solve problems in archaeology that are formulated in terms of space-temporal variability.
19. Synthesise the advanced knowledge existing in this area.
20. That students are able to integrate knowledge and handle complexity and formulate judgments based on information that was incomplete or limited, include reflecting on social and ethical responsibilities linked to the application of their knowledge and judgments.
21. That the students can apply their knowledge and their ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study.
22. Theorise about the possibility of analysing and explaining the prehistoric past based on scientific analysis of spatial variation (micro and macro).
23. Theorise about the possibility of analysing and explaining the prehistoric past based on scientific analysis of temporal variation of chronological series.

Content

Introduction to the analysis of space and time in Archeology (Theory)
Spatial data: Macro scale. Documentation and Study of Archaeological L
Spatial data: Micro scale. Documentation and Study of Archaeological Si
Spatial data: Practices with computers and software (Geographic Informa
Analysis and interpretation of the archaeological space. Theory and Prac
Time measurement in Archeology: radiocarbon and other techniques
Spatio-temporal analysis in Archeology: stratigraphy and serialization
Spatio-temporal data processing. Temporary databases
Chrono-Statistics. Internships with software.

Methodology

Guided activities: theoretical classes with an explanation of computer techniques and their theoretical and metho
Supervised activities: Presentation of computer equipment. Practices wit
Autonomous activities: search for documentation, elaboration of databas
Problem-based learning
Case-based learning
Classroom practical work (Computer Lab)
seminars
workshops
debates
Written essays
Personal study
The guided activities can be face-to-face or online.
Note: 15 minutes of a class will be reserved, within the calendar establis

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			
Teaching and debating theoretical and methodological aspects of the subject	36	1.44	6, 4, 10, 9, 13, 20, 17, 19, 14, 22, 23, 7
Type: Supervised			
Practical work using computer equipment and specialized software	25	1	1, 6, 4, 15, 16, 13, 20, 21, 18, 8
Type: Autonomous			
Reading scientific and technical literature. Writing reports and essais	81	3.24	12, 5, 6, 4, 3, 2, 11, 13, 20, 21, 18, 22, 23, 8, 7

Assessment

Individual test on the topics explained in class (30%). It can be a critical bibliographic study on the methodology of spatio-temporal analysis or practical application of one of the techniques explained with the students' own data.

Other reports and written work (individual or group) at the teachers' discretion (25% of the final grade).

Written summaries of the practical sessions, insisting on the positive and negative aspects of the techniques and methods explained (25% of the final grade).

Critical commentary of texts of the specialty, from the bibliography that will be provided at the beginning of the course (25% of the final grade).

Class participation (face-to-face or telematic), attendance to tutorials (face-to-face or telematic). 10% of the final grade.

Participation in conferences programmed by the coordination of the master's degree and other complementary activities (10%).

At the time of completion / delivery of each evaluable activity, the faculty will inform (Moodle, SIA) of the procedure and date of review of grades.

The student will receive the grade of Not evaluable as long as he/she has not taken the individual test on the topics explained in class and has not delivered more than 50% of the summaries of the practical sessions and text commentaries.

In case the student performs any irregularity that may lead to a significant variation of the grade of an evaluation act, this evaluation act will be graded with 0, regardless of the disciplinary process that may be instigated. In case of several irregularities in the evaluation acts of the same subject, the final grade of this subject will be 0.

In the event that the tests cannot be taken in person, the format will be adapted (maintaining the weighting) to the possibilities offered by the virtual tools of the UAB. Homework, activities and class participation will be done through forums, wikis and / or exercise discussions through Moodle, Teams, etc.The faculty will ensure that the student can access or offer alternative means, which are within their reach.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Attending lectures and active participation in debates	10%	0	0	6, 4, 10, 9, 13, 20, 21, 17, 19, 14, 22, 23, 8, 7
Complementary activities (General lectures. Practical work at Laboratory)	10%	4	0.16	1, 6, 2, 10, 9, 20, 18, 8
Individual Examination about subjects considered (Oral and/or written)	30%	4	0.16	1, 12, 5, 6, 4, 3, 2, 15, 16, 10, 9, 11, 13, 20, 21, 18, 17, 19, 14, 22, 23, 8, 7
Written comments on bibliographic references	25	0	0	12, 5, 6, 3, 10, 9, 11, 20, 21, 19, 8, 7
Written reports and essais	25%	0	0	1, 12, 5, 6, 3, 15, 16, 11, 13, 20, 21, 18, 19, 8

Bibliography

BARCELÓ, J.A., MORELL, B., 2020, Métodos Cronométricos en Arqueología, Historia y Paleontología. Madrid. Editorial Dextra.

CARLSON, D. L. (2017). *Quantitative methods in archaeology using R*. Cambridge University Press.

CONNOLLY, J., LAKE, M., 2009, Sistemas de Información geográfica aplicados a la Arqueología. Ediciones Bellaterra
DE SMITH, M.J., GOODCHILD, M., LONGLEY, P., 2009, Geospatial Analysis. Winchelsea Press. (www.spatialanalysisonline.comDE VAUX, VELLEMAN, BOCK, Stats: Data and Models (3 edición). Pearson, Addison-Wesley (con ejercicios y programas para estudiantes: http://www.pearsonhighered.com/educator/product/Stats-Data-and-Models/0321692551.page

GILLINGS, M., HACIGÜZELLER, P., & LOCK, G. (Eds.). (2020). *Archaeological spatial analysis: a methodological guide*. Routledge.

HAMMER,O., HARPER,D., 2005, Paleontological Data Analysis. Blackwell.
KAMERMANS, H., LEUSEN, M.J., VERHAGEN , P., 2009, Archaeological Prediction and Risk Management. Leiden University

MCCOY, Mark D. The Site Problem: A critical review of the site concept in archaeology in the Digital Age. *Journal of Field Archaeology*, 2020, 45.sup1: S18-S26.
OTÁROLA-CASTILLO, Erik; TORQUATO, Melissa G. Bayesian statistics in archaeology. *Annual Review of Anthropology*, 2018, 47: 435-453.

ZIMMERMAN, L., GREEN, 2007, W., The Archaeologist's Toolkit. (7 vol.) Altamira Press.

Software

ArcGIS (ESRI): Free licence for UAB students

QGIS (https://www.qgis.org/en/site/) OpenSource. Free access.

OxCAL (https://c14.arch.ox.ac.uk/oxcal.html). OpenSource. Free access.

ChronoModel (https://chronomodel.com/). OpenSource. Free access.

PAST (https://www.nhm.uio.no/english/research/infrastructure/past/). OpenSource. Free access.

R (https://cran.r-project.org/)