

Lithic Artefacts: Production and Use

Code: 44482
ECTS Credits: 6

Degree	Type	Year	Semester
4317545 Prehistoric Archaeology	OT	0	2

Contact

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Use of Languages

Principal working language: spanish (spa)

Teachers

David Manuel Gómez Gras
Roberto Risch
Antoni Palomo Pérez

Prerequisites

Students should be able, at least, to read scientific texts written in English.

Objectives and Contextualisation

This module focuses on the global analysis of lithic (macrolithic as well as flaked) artefacts from a holistic point of view that tackles the origin of the raw materials, their transformation, and, finally, the use of the achieved tools.

Firstly, the thematic development includes the characterization of rocks through application of geological and geomorphic parameters, with the goal of identifying the areas of extraction of the raw materials. These skills will include a geoarchaeological survey that will involve a field trip. This exercise will conclude with an archaeological assessment of the results, considering social and economic aspects.

Secondly, the study of the artefacts' process of production will be undertaken. As part of this, the technologies of stonework will be reviewed and the role of experimental archaeology in the understanding of technical and cognitive processes will be assessed. Then, the social functions and forms of consumption of the artefacts (use, maintenance, recycling, and disposal) will be examined. The combination of experimental testing, ethnoarchaeology and functional analysis (traceology and residue analysis) will form key aspects in this regard. This topic includes familiarization with electronic microscopy devices.

Lastly, global archaeological contexts that include lithic material will be examined. Their social contribution in absolute (production volume) and relative (productivity) terms will be assessed, starting with the Lower Palaeolithic up to Later Prehistory and in ethnographic cases.

Competences

- Combine findings from different programmes of specialist analysis, identifying any contradictions and drawing conclusions

- 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 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.
- Show rigour, responsibility and quality in research and dissemination work.
- 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 students have the learning skills that enable them to continue studying in a way that will be largely self-directed or autonomous.
- 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. Critically apply research techniques in zooarchaeology.
2. Critically assess the value of the different tools needed for research in archaeobotany.
3. Demonstrate the ability to integrate into a team with specialists from other disciplines.
4. Knowledge and understanding that provide a basis or opportunity for originality in developing and / or applying ideas, often in a research context.
5. Link field work and the study of prehistoric lithic resources to the specific problems of historical knowledge to be solved.
6. 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.
7. That students have the learning skills that enable them to continue studying in a way that will be largely self-directed or autonomous.
8. 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.
9. Use acquired knowledge as a basis for originality in the application of ideas, often in a context of archaeobotanical research.
10. Use the specific technical vocabulary for interpretation in the field of archaeobotany.
11. Use the specific technical vocabulary for interpretation.

Content

A. Methods of geoarchaeology

Dr. David Gómez Gras i Dr. Roberto Risch

B. The petrographic, technologic and functional study of (macro)lithic artefacts

Dr. Alba Masclans and Dr. Roberto Risch

C. Analysis of lithic artefacts from an experimental perspective

Dr. Toni Palomo

D. Lithic technology and human evolution

Dr. Rafael Mora

Methodology

The course includes seminars, field work, experimental production of lithic artefacts, and different and microscopy.

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			
Cognitive abilities of hominids and technologic processes.	6	0.24	8, 7, 5, 4
Develop basic skills to autonomously carry out a techno-functional approach to lithic tools.	40	1.6	10, 6, 8, 7, 5, 4, 9
State of play in the discussion on human evolution.	6	0.24	6, 8, 4
Understanding of petrographic and mechanical properties of raw materials.	12	0.48	3, 11, 6, 8, 7, 5, 4
Type: Supervised			
Paleo-economic analysis of sexual and social divisions of labour, based on lithic artefacts.	20	0.8	6, 8, 7, 4, 9
Practical study of a fluvial deposit in order to assess and quantify which lithologies can be used as artefacts, as well as which geological units they come from.	6	0.24	3, 6, 8, 7, 5, 4
To gain autonomy when carrying out a process of experimental research.	16	0.64	6, 8, 7, 5

Assessment

Carrying out an essay, to choose from a list of topics or to be proposed by the student. The works will be tutored

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Attendance at seminars and practica	50%	20	0.8	1, 2, 3, 11, 10, 6, 8, 7, 5, 4, 9
Autonomous work concerning a specific archaeological problem	35%	20	0.8	3, 8, 7, 5, 4, 9
Geoarchaeological field work	15%	4	0.16	3, 11, 6, 8, 5, 9

Bibliography

Ache, M., Delgado-Raack, S., Molina, E., Risch, R. & Rosell-Melé, A. 2017, 'Evidence of bee products processing: A functional definition of a specialized type of macro-lithic tool', *Journal of Archaeological Science: Reports* 14, 638-650.

Adams, J., Delgado, S., De Breuil, L., Hamon, C., Plisson, H., Risch, R. (2009). Functional analysis of macro-lithic artefacts: a focus on working surfaces. At: Sternke, F., Eigeland, L. and Costa, L.J. (Eds.), *L'utilisation préhistorique de matières premières lithiques alternatives*. Oxford, British International Series 1939, pp. 43-66.

Delgado-Raack, S. und Risch, R. (2016): "Bronze Age cereal processing in southern Iberia: A material approach to the production and use of grinding equipment", *Journal of Lithic Studies*, 3 (3): 125-145.

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D. Lithic technology and human evolution

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Software

A. Methods of geoarchaeology

A.1. Introduction to the petrographic and geochemical study of rocks and minerals, as the main methods of characterization of raw materials in archaeology. Importance of textural and compositional features of lithologies in archaeometrical studies.

A.2. Laboratory exercise: *De visu*, microscopical and chemical identification of lithologies that are relevant to archaeological research.

A.3. Field work: Study of the lithologies of a fluvial terrace, quantification of the types of clasts, and assignment of the rocks to the cartographic units on the geological map of the river basin. Analysis of the secondary deposits considering "social affordability level" of the raw materials.

Specific skills:

- The students will learn how to identify the main types of rocks and will understand that compositional and textural features determine their use as lithic artefacts.

- They will learn to carry out a practical study of a fluvial deposit in order to assess and quantify which lithologies can be used as artefacts, as well as which geological units they come from.

B. The petrographic, technologic and functional study of (macro)lithic artefacts

B.1. Development of a research process based on the study of macrolithic artefacts: study of grinding processes as a means of sexual and social exploitation.

B.2. Presentation of a research process based on the study of polished and bevelled macrolithic artefacts (BMA): functional study of the BMAs used in the study of sexual division of labour in the Neolithic.

Explanation of the main methods and techniques used on the technological and functional study of the BMAs. Exercise on the techno-functional study of archaeological materials.

B.3. Development of an experimental test with macrolithic artefacts that includes their development and use in different activities. Observation and discussion of results on a functional level.

Specific Skills:

- Understanding of planification, development and completion of a research process based on the study of polished and bevelled macrolithic artefacts.

- Grasp the main chances for interpretation that the study of BMAs can offer.

- Develop basic skills to autonomously carry out a first techno-functional approach to BMAs.

- Gaining autonomy when carrying out a process of experimental research.

C. Analysis of lithic artefacts from an experimental perspective

This block will focus on the production and use of the tools from an experimental perspective. Here, the students will see demonstrations and partake in practical exercises. Based on specific case studies, the experimental module wants to delve into how research on flaked lithic artefacts is approached. The analysed cases will allow students to deal with topics such as the characterization of raw materials, the technologic processes, and the purpose of the produced tools. Archaeological experimentation as basic methodology will often be applied to contrast hypothesis.

C.1. Introduction to the study of lithic industry in recent Prehistory. The flaked lithic industry in the early Neolithic: characterization of the material's origin, carving methods, applied technology, and purpose. Demonstration of carving methods and techniques in the early Neolithic. Indirect percussion.

C.2. Flaked lithic industry in the middle Neolithic, jagged flint, and heat treatment. Characterization of the material's origin, carving methods, applied technology, and purpose. Demonstration of carving methods and techniques in the middle Neolithic. Pressure flaking.

C.3. Flaked lithic industry in the late Neolithic, production of big sheets, use of lever pressure. Characterization of the material's origin, carving methods, applied technology, and purpose.

Specific Skills:

- Gaining autonomy when carrying out a process of experimental research.

D. Lithic technology and human evolution

In this block, methods and concepts tackled in earlier sessions will be applied with the purpose of envisioning human evolution through lithic technology. The protagonists (hominins) and the technical skills linked to them will be put into context.

D.1. Myths and legends in the origin of lithic technology. Primates facing the *Homo* genus.

D.2. Comparing technologies in the Lomekwian, Oldowan and Acheulean.

D.3. Technology and typology (*H. Neanderthal* and *H. Sapiens*)

Specific Skills:

- The role of ethics in archaeologic discussion
- Identifying raw materials
- Identifying cultural objects based on the stigma and variables that make them up
- Cognitive abilities of hominids and technologic processes
- Archaeological contexts and their meanings in relation to lithic objects
- Training of the senses during the identifying of technical abilities
- State of play in the discussion on human evolution