

SUBJECT TEACHING GUIDE

224 - Analysis techniques of Ceramic and Metallic Material

Master's Degree in Prehistory and Archaeology

Academic year 2025-2026

1. IDENTIFYING DATA					
Degree	Master's Degree in Prehistory and Archaeology			Type and Year	Optional. Year 1
Faculty	Faculty of Humanities				
Discipline	Optional Subjects in Both Specialities				
Course unit title and code	224 - Analysis techniques of Ceramic and Metallic Material				
Number of ECTS credits allocated	3	Term	Semester based (2)		
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. CIENCIAS HISTORICAS				
Name of lecturer	PABLO ARIAS CABAL				
E-mail	pablo.arias@unican.es				
Office	Edificio Interfacultativo. Planta: + 1. DESPACHO PROFESORES (146)				
Other lecturers					

3.1 LEARNING OUTCOMES
- Basic knowledge on the techniques of the available physical-chemical analysis
- Ability for a critical interpretation of the results of the analyses of ceramic and metallic materials
- Discern of the appropriate analytical techniques according to the problems that are faced
- Development of critical sense in the processes of scientific research

4. OBJECTIVES
Introduction of the students in the techniques of analysis of ceramic and metallic materials

6. SUBJECT PROGRAM	
CONTENTS	
1	Analysis of ceramic materials 1.1. Introduction to the archaeometric analysis of pottery 1.2. Techniques of mineralogical and microstructure analysis 1.3. Techniques of chemical analysis and statistics 1.4. Analysis of data and archaeological interpretation
2	Archaeometallurgy 2.1. Techniques of elemental analysis 2.2. Metallography 2.3. Analysis of lead isotopes 2.4. Technology of the copper metallurgy 2.5. The noble metals 2.6. Technology of the iron metallurgy 2.7. Mining and mineral resources
3	Seminar: Physico-chemical characterization of the copper based materials

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
Elaboration of an essay on a topic related to the course	Work	No	Yes	80,00
Participation in the activities of the course	Others	No	No	20,00
TOTAL				100,00
Observations				
Observations for part-time students				
The disposability of time of the students will be considered in the assignation of the topic for the essay. In the case of partial time students the topic and the deadline will be adapted to their specific necessities.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

ARNOLD, D.E. (1985): *Ceramic Theory and Cultural Process*. Cambridge University Press, *New Directions in Archaeology*, Cambridge.

BROTHWELL, D. & POLLARD, A. M. (2001) *Handbook of Archaeological science*, Londres, John Wiley & Sons, Ltd.

FERNÁNDEZ-MANZANO, J. y MONTERO RUIZ, I. (2001): El estudio de la metalurgia: una historia de frustraciones y aciertos. En M. Ruiz-Gálvez (coord.): *La Edad del Bronce. ¿primera Edad de Oro de España? Sociedad, economía e ideología. Crítica/arqueología*. Crítica. Barcelona: 31-54.

FERNÁNDEZ-MANZANO, J. y SARABIA, F.J. (1998): *Arqueometalurgia del bronce. Introducción a la metodología de trabajo*. *Studia Archaeologica*, 86. Universidad de Valladolid. Valladolid.

GARCÍA HERAS, M. y OLAETXEA, C. (1992): "Métodos y análisis para la caracterización de cerámicas arqueológicas. Estado actual de la investigación en España", *Archivo Español de Arqueología*, 65: 263-289

HUNT ORTIZ, M.A. (2003) *Prehistoric Mining and Metallurgy in South West Iberian Peninsula*. BAR, *International Series*, 1188. Archaeopress. Oxford.

LINARES, J.; HUERTAS, F. y CAPEL, J. (1983): "La arcilla como material cerámico. Características y comportamiento", *Cuadernos de Prehistoria de la Universidad de Granada*, 8: 479-490

LIVINGSTONE SMITH, A., BOSQUET, D. & MARTINEAU, R. (2005) *Pottery manufacturing processes: reconstitution and interpretation*, Oxford, Archaeopress (BAR *International Series* 1349).

MOHEN, J. P. (1992): *Metalurgia prehistórica. Introducción a la paleometalurgia*. Masson, s.a. Barcelona.

MONTERO RUIZ, I. (1999): *Arqueometalurgia en el Mediterráneo*. Centro de Estudios del Próximo Oriente. *Lenguas y Culturas del Antiguo Oriente Próximo*, 3. Ediciones Clásicas. Madrid.

MONTERO, I. (coord.), 2010. *Manual de Arqueometalurgia*. Alcalá de Henares, Museo Arqueológico Regional

ORTON, C.; TYERS, P. y VINCE, A. (1993): *Pottery in Archaeology*. Cambridge University Press, *Cambridge Manuals in Archaeology*, Cambridge

PEREA, A. (1998): *Metalurgia del oro. Ámbitos tecnológicos en Prehistoria*. *Boletín Geológico y Minero*, 109 (5-6): 145-155.

PERNICKA, E. 1998: *Whiter metal analysis in archaeology?*. En C. Mordant, M. Pernot, V. Rychner (eds.): *L'atelier du bronzier en Europe du XX au VIII siècle avant notre ère. Actes du colloque international Bronze '96 Neuchâtel et Dijon*,

QUINN, P. S. (2013) *Ceramic petrography. The interpretation of archaeological pottery and related artefacts in thin section*, Oxford, Archaeopress.

REEDY, C. L. (2008) *Thin-section petrography of stone and ceramic cultural materials*, Londres, Archetype Publications.

RICE, P.M. (1987): *Pottery Analysis: a Sourcebook*. Chicago University Press, Chicago (Illinois).

RYE, O.S. (1981): *Pottery Technology. Principles and Reconstruction*. Taraxacum Inc., *Manuals on Archaeology Vol. 4*, Washington D.C

SILLAR, B. & TITE, M. S. (2000) *The challenge of "technological choices" for materials science approaches in archaeology*. *Archaeometry*, 42, 2-20.

TITE, M.S. (1999): "Pottery production, distribution, and consumption. The contribution of the Physical Sciences", *Journal of Archaeological Method and Theory*, 6 (3): 181-233.