



Teaching Guide

Identifying Data					2024/25
Subject (*)	Digital Management of Archaeological Heritage		Code	614552008	
Study programme	Máster Universitario en Patrimonio Cultural Dixital				
Descriptors					
Cycle	Period	Year	Type	Credits	
Official Master's Degree	2nd four-month period	First	Optional	5	
Language	Spanish				
Teaching method	Face-to-face				
Prerequisites					
Department	Física e Ciencias da Terra				
Coordinador	Grandal D' Anglade, Aurora		E-mail	aurora.grandal@udc.es	
Lecturers	Blanco Calvo, Luis Alejandro Grandal D' Anglade, Aurora		E-mail	alejandrobancoc@udc.es aurora.grandal@udc.es	
Web					
General description	In the field of archaeological heritage, digitisation plays a communicative, educational and also promotional role with respect to the heritage collection. The use of digital photography, 3D treatments of archaeological or palaeontological sites and objects and ethnographic elements, virtual reconstructions or the appropriate use of audiovisual and virtualisation systems are some of the elements to be presented and worked with in this field.				

Study programme competences / results

Code	Study programme competences / results
A7	CON7-Knowledge about the virtualization of cultural heritage: infographics, augmented reality, 3D visualization, geolocation, photointerpretation
A8	CON8-Knowledge of digital cartography/geographic information systems
A12	CON12-Knowledge about digital tools for organization and management of archeological heritage
B1	HAB1-Be able to establish relationships to produce knowledge in the digital intelligence environment
B4	HAB4-Be able to identify sources of information, collect and analyze data and elaborate syntheses in relation to them
B6	DES1-Be able to handle technological and computer tools applied to the digitization of heritage
C2	CB2. That students know how to apply the knowledge acquired and their problem-solving ability in new or little-known environments within broader (or multidisciplinary) contexts related to their area of study
C3	CB3. That students are able to integrate knowledge and face the complexity of making judgements based on information that, being incomplete or limited, includes reflections on the social and ethical responsibilities linked to the application of their knowledge and judgements
C5	CB5. That students possess the learning skills that allow them to continue studying in a way that will be largely self-directed or autonomous
C6	CG1. Build, manage and disseminate digital heritage and the digital treatment of heritage in all its meanings
C7	CG2. Apply knowledge in the implementation of heritage projects in the digital environment
C8	CG3. Properly use the technological tools necessary for the acquisition, processing, management and dissemination of digital cultural heritage
C10	CG5. Work in interdisciplinary teams in market business and institutional fields of cultural management
C11	CG6. Create original content in the field of cultural heritage combining humanistic and technological knowledge
C12	CT1. Adapt the use and transfer of knowledge to new situations derived from technological change.
C14	CT3. Acquire an ethical commitment to the various forms of communication in digital environments.
C15	CT4. Comprender los valores de la igualdad, sostenibilidad ambiental y el derecho al acceso equitativo a los recursos tecnológicos en el cuidado del patrimonio cultural digital.

Learning outcomes



Learning outcomes	Study programme competences / results		
To learn about digital tools for the organization and management of archaeological heritage and virtualization methods.	AJ7 AJ8 AJ12		
To acquire knowledge about the importance of preservation and dissemination of archaeological heritage.			CJ3 CJ6 CJ8 CJ14 CJ15
To be able to develop a project of digitization of archaeological heritage from various sources.		BJ1 BJ4 BJ6	
To understand the importance and use of multidisciplinary collaboration for the dissemination of archaeological heritage managed with digital tools.			CJ2 CJ5 CJ7 CJ10 CJ11 CJ12

Contents	
Topic	Sub-topic
1. Introduction	Archaeological and paleontological heritage. Industrial heritage. Ethnographic heritage. Elements and characteristics.
2. Digitization in the field of archaeological heritage.	Digitization of archaeological and ethnographic objects and evidences. Digitization of archaeological sites.
3. Use of analytical and digital photography.	Photography of archaeological evidence. Orientation and views. Aerial photography. Optical microscope and SEM photography. Two-dimensional image processing.
4. 3D treatments of archaeological or artistic sites and objects and ethnographic elements.	Graphic design of the digital images (Photoshop and GIMP). 3D modeling (Blender).
5. Virtual reconstructions.	Surface digitization methods: photogrammetry, light scanners and mechanical digitization. Tomography-based digitization methods: destructive (physical-optical, FIB) and non-destructive methods (CTs, MRI, optical).
6. Use of audiovisual and virtualization systems.	Vídeo-audio applications for management of digital resources. Augmented reality (AR), virtual (VR) and mixed (MR). Game engines.

Planning				
Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student?s personal work hours	Total hours
Introductory activities	A7 A8 A12	4	8	12
Document analysis	B4 C2 C3 C12 C14	8	16	24
Laboratory practice	B1 B6 C6 C8 C11	15	30	45
Field trip	C8	4	4	8
Research (Research project)	B4 B6 C5 C7 C10 C11 C15	3	30	33
Personalized attention		3	0	3

(*)The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.



Methodologies

Methodologies	Description
Introductory activities	Review of archaeological heritage elements susceptible to digitization.
Document analysis	Analysis of some sites and their material culture, and the digitization methodologies applied in each case.
Laboratory practice	Handling of archaeological objects and sites, digitization planning and first steps in obtaining digitized data.
Field trip	Obtaining data from archaeological objects / sites for the realization of the project.
Research (Research project)	Carrying out the digitization of the selected object/site, elaboration of a project and its exposition.

Personalized attention

Methodologies	Description
Research (Research project)	The student will be guided in the initial stages of the project and throughout its duration in an individualised manner

Assessment

Methodologies	Competencies / Results	Description	Qualification
Research (Research project)	B4 B6 C5 C7 C10 C11 C15	realización do traballo, cualidade do resultado, grao de implicación no proceso, aplicación dunha perspectiva de conservación, divulgación e xestión.	70
Field trip	C8	Asistencia e participación activa	5
Introductory activities	A7 A8 A12	Asistencia e participación activa	5
Laboratory practice	B1 B6 C6 C8 C11	Asistencia e realización satisfactoria do traballo	15
Document analysis	B4 C2 C3 C12 C14	Asistencia e participación activa	5

Assessment comments



To pass the course it will be necessary to obtain at least 50% of the qualification corresponding to each of the methodologies. The final grade will be the weighted average according to the percentages of each methodology.

In the case of fraudulent performance of the tests or evaluation activities, the current regulations of the UDC will be applied.

Students with academic dispensation will do the work and assignments individually, with deliveries on the dates set by the teacher, and will have personalized attention in the tutoring schedule, to clarify doubts about the work and also about the theoretical and practical framework of the subject.

@font-face
{font-family:"Cambria Math";
panose-1:2 4 5 3 5 4 6 3 2 4;



```
mso-font-charset:0;
mso-generic-font-family:roman;
mso-font-pitch:variable;
mso-font-signature:3 0 0 0 1 0;}@font-face
{font-family:Calibri;
panose-1:2 15 5 2 2 2 4 3 2 4;
mso-font-charset:0;
mso-generic-font-family:swiss;
mso-font-pitch:variable;
mso-font-signature:-536859905 -1073732485 9 0 511 0;}p.MsoNormal, li.MsoNormal, div.MsoNormal
{mso-style-unhide:no;
mso-style-qformat:yes;
mso-style-parent:"";
margin:0cm;
mso-pagination:widow-orphan;
font-size:12.0pt;
font-family:"Calibri",sans-serif;
mso-ascii-font-family:Calibri;
mso-ascii-theme-font:minor-latin;
mso-fareast-font-family:Calibri;
mso-fareast-theme-font:minor-latin;
mso-hansi-font-family:Calibri;
mso-hansi-theme-font:minor-latin;
mso-bidi-font-family:"Times New Roman";
mso-bidi-theme-font:minor-bidi;
mso-font-kerning:1.0pt;
mso-ligatures:standardcontextual;
mso-ansi-language:ES-TRAD;
mso-fareast-language:EN-US;}MsoChpDefault
{mso-style-type:export-only;
mso-default-props:yes;
font-family:"Calibri",sans-serif;
mso-ascii-font-family:Calibri;
mso-ascii-theme-font:minor-latin;
mso-fareast-font-family:Calibri;
mso-fareast-theme-font:minor-latin;
mso-hansi-font-family:Calibri;
mso-hansi-theme-font:minor-latin;
mso-bidi-font-family:"Times New Roman";
mso-bidi-theme-font:minor-bidi;
mso-ansi-language:ES-TRAD;
mso-fareast-language:EN-US;}div.WordSection1
{page:WordSection1;}
```





<p>Basic</p>	<p>- Eiroa, J.J., Bachiller, J.A., Castro Tamos, L. (1999) Nociones de tecnología y tipología en prehistoria. Barcelonas: Ariel.- Madrigal, A. (2013). Desenterrar el pasado. Introducción al Patrimonio Arqueológico. Madrid: Ministerio de Educación, Cultura y Deporte.- Muñoz ibáñez, F.J., San Nicolás Pedraz, M.P. 2010. La cultura material como fuente esencial de conocimiento en Arqueología. Ed. UNED.- Remondino, F. y Campana, E. (2014). 3D modeling in archaeology and cultural heritage. Theory and best practices. BAR International Series 2598. Oxford: Archaeopress. - VV AA. (2018) Digital Heritage. Progress in Cultural Heritage: Documentation, Preservation, and Protection. 7th International Conference, EuroMed 2018, Nicosia, Cyprus, October 29 ? November 3, 2018, Proceedings, I y II. En: Lecture Notes in Computer Science (Springer), vols. 11196 y 11197. @font-face {font-family:Times; panose-1:2 0 5 0 0 0 0 0 0 0; mso-font-charset:0; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:3 0 0 0 1 0;}@font-face {font-family:"?? ??"; mso-font-charset:78; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:1 134676480 16 0 131072 0;}@font-face {font-family:"Cambria Math"; panose-1:2 4 5 3 5 4 6 3 2 4; mso-font-charset:0; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:3 0 0 0 1 0;}@font-face {font-family:Cambria; panose-1:2 4 5 3 5 4 6 3 2 4; mso-font-charset:0; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:-536870145 1073743103 0 0 415 0;}p.MsoNormal, li.MsoNormal, div.MsoNormal {mso-style-unhide:no; mso-style-qformat:yes; mso-style-parent:""; margin:0cm; margin-bottom:.0001pt; mso-pagination:widow-orphan; font-size:12.0pt; font-family:Cambria; mso-ascii-font-family:Cambria; mso-ascii-theme-font:minor-latin; mso-fareast-font-family:"?? ??"; mso-fareast-theme-font:minor-fareast; mso-hansi-font-family:Cambria; mso-hansi-theme-font:minor-latin; mso-bidi-font-family:"Times New Roman"; mso-bidi-theme-font:minor-bidi;}MsoChpDefault {mso-style-type:export-only; mso-default-props:yes; font-family:Cambria; mso-ascii-font-family:Cambria; mso-ascii-theme-font:minor-latin; mso-fareast-font-family:"?? ??"; mso-fareast-theme-font:minor-fareast; mso-hansi-font-family:Cambria; mso-hansi-theme-font:minor-latin; mso-bidi-font-family:"Times New Roman"; mso-bidi-theme-font:minor-bidi;}div.WordSection1 {page:WordSection1;}@font-face {font-family:"?? ??"; mso-font-charset:78; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:1 134676480 16 0 131072 0;}@font-face {font-family:"?? ??"; mso-font-charset:78; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:1 134676480 16 0 131072 0;}@font-face {font-family:Cambria; panose-1:2 4 5 3 5 4 6 3 2 4; mso-font-charset:0; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:-536870145 1073743103 0 0 415 0;}p.MsoNormal, li.MsoNormal, div.MsoNormal {mso-style-unhide:no; mso-style-qformat:yes; mso-style-parent:""; margin:0cm; margin-bottom:.0001pt; mso-pagination:widow-orphan; font-size:12.0pt; font-family:Cambria; mso-ascii-font-family:Cambria; mso-ascii-theme-font:minor-latin; mso-fareast-font-family:"?? ??"; mso-fareast-theme-font:minor-fareast; mso-hansi-font-family:Cambria; mso-hansi-theme-font:minor-latin; mso-bidi-font-family:"Times New Roman"; mso-bidi-theme-font:minor-bidi;}MsoChpDefault {mso-style-type:export-only; mso-default-props:yes; font-family:Cambria; mso-ascii-font-family:Cambria; mso-ascii-theme-font:minor-latin; mso-fareast-font-family:"?? ??"; mso-fareast-theme-font:minor-fareast; mso-hansi-font-family:Cambria; mso-hansi-theme-font:minor-latin; mso-bidi-font-family:"Times New Roman"; mso-bidi-theme-font:minor-bidi;}div.WordSection1 {page:WordSection1;}@font-face {font-family:"?? ??"; mso-font-charset:78; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:-536870145 1791491579 18 0 131231 0;}@font-face {font-family:"Cambria Math"; panose-1:2 4 5 3 5 4 6 3 2 4; mso-font-charset:0; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:-536870145 1107305727 0 0 415 0;}@font-face {font-family:Cambria; panose-1:2 4 5 3 5 4 6 3 2 4; mso-font-charset:0; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:-536870145 1073743103 0 0 415 0;}p.MsoNormal, li.MsoNormal, div.MsoNormal {mso-style-unhide:no; mso-style-qformat:yes; mso-style-parent:""; margin:0cm; margin-bottom:.0001pt; mso-pagination:widow-orphan; font-size:12.0pt; font-family:Cambria; mso-ascii-font-family:Cambria; mso-ascii-theme-font:minor-latin; mso-fareast-font-family:"?? ??"; mso-fareast-theme-font:minor-fareast; mso-hansi-font-family:Cambria; mso-hansi-theme-font:minor-latin; mso-bidi-font-family:"Times New Roman"; mso-bidi-theme-font:minor-bidi;}MsoChpDefault {mso-style-type:export-only; mso-default-props:yes; font-family:Cambria; mso-ascii-font-family:Cambria; mso-ascii-theme-font:minor-latin; mso-fareast-font-family:"?? ??"; mso-fareast-theme-font:minor-fareast; mso-hansi-font-family:Cambria; mso-hansi-theme-font:minor-latin; mso-bidi-font-family:"Times New Roman"; mso-bidi-theme-font:minor-bidi;}div.WordSection1 {page:WordSection1 @font-face {font-family:"?? ??";</p>
--------------	--



mso-font-charset:78; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:-536870145 1791491579 18 0 131231 0;>@font-face {font-family:"?? ??"; mso-font-charset:78; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:-536870145 1791491579 18 0 131231 0;}@font-face {font-family:Calibri; panose-1:2 15 5 2 2 2 4 3 2 4; mso-font-charset:0; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:-520092929 1073786111 9 0 415 0;}@font-face {font-family:Cambria; panose-1:2 4 5 3 5 4 6 3 2 4; mso-font-charset:0; mso-generic-font-family:auto; mso-font-pitch:variable; mso-font-signature:-536870145 1073743103 0 0 415 0;}p.MsoNormal, li.MsoNormal, div.MsoNormal {mso-style-unhide:no; mso-style-qformat:yes; mso-style-parent:""; margin:0cm; margin-bottom:.0001pt; mso-pagination:widow-orphan; font-size:12.0pt; font-family:Calibri; mso-ascii-font-family:Calibri; mso-ascii-theme-font:minor-latin; mso-fareast-font-family:"?? ??"; mso-fareast-theme-font:minor-fareast; mso-hansi-font-family:Calibri; mso-hansi-theme-font:minor-latin; mso-bidi-font-family:"Times New Roman"; mso-bidi-theme-font:minor-bidi;}MsoChpDefault {mso-style-type:export-only; mso-default-props:yes; font-family:Calibri; mso-ascii-font-family:Calibri; mso-ascii-theme-font:minor-latin; mso-fareast-font-family:"?? ??"; mso-fareast-theme-font:minor-fareast; mso-hansi-font-family:Calibri; mso-hansi-theme-font:minor-latin; mso-bidi-font-family:"Times New Roman"; mso-bidi-theme-font:minor-bidi;}div.WordSection1 {page:WordSection1;}



Complementary	
---------------	--

Recommendations

Subjects that it is recommended to have taken before

Subjects that are recommended to be taken simultaneously

Subjects that continue the syllabus

Other comments



The use of student's photographic camera and a previous basic expertise on photography is highly recommended. In this subject the gender perspective

will be incorporated (non-sexist language will be used, bibliography of authors of both sexes will be used, the intervention of male and female students in class will be encouraged...). We will work to identify prejudices and sexist attitudes and will influence the environment to modify them and promote values of respect and equality. We will try to detect situations of gender discrimination and, if there are any, we will propose actions and measures to correct them.

@font-face

```
{font-family:"Cambria Math";
panose-1:2 4 5 3 5 4 6 3 2 4;
mso-font-charset:0;
mso-generic-font-family:roman;
mso-font-pitch:variable;
mso-font-signature:3 0 0 0 1 0;}@font-face
{font-family:Calibri;
panose-1:2 15 5 2 2 2 4 3 2 4;
mso-font-charset:0;
mso-generic-font-family:swiss;
mso-font-pitch:variable;
mso-font-signature:-536859905 -1073732485 9 0 511 0;}p.MsoNormal, li.MsoNormal, div.MsoNormal
{mso-style-unhide:no;
mso-style-qformat:yes;
mso-style-parent:"";
margin:0cm;
mso-pagination:widow-orphan;
font-size:12.0pt;
font-family:"Calibri",sans-serif;
mso-ascii-font-family:Calibri;
mso-ascii-theme-font:minor-latin;
mso-fareast-font-family:Calibri;
mso-fareast-theme-font:minor-latin;
mso-hansi-font-family:Calibri;
mso-hansi-theme-font:minor-latin;
mso-bidi-font-family:"Times New Roman";
mso-bidi-theme-font:minor-bidi;
mso-font-kerning:1.0pt;
mso-ligatures:standardcontextual;
mso-ansi-language:ES-TRAD;
mso-fareast-language:EN-US;}MsoChpDefault
{mso-style-type:export-only;
mso-default-props:yes;
font-family:"Calibri",sans-serif;
mso-ascii-font-family:Calibri;
```



mso-ascii-theme-font:minor-latin;
mso-fareast-font-family:Calibri;
mso-fareast-theme-font:minor-latin;
mso-hansi-font-family:Calibri;
mso-hansi-theme-font:minor-latin;
mso-bidi-font-family:"Times New Roman";
mso-bidi-theme-font:minor-bidi;
mso-ansi-language:ES-TRAD;
mso-fareast-language:EN-US;}div.WordSection1
{page:WordSection1;}@font-face
{font-family:"Cambria Math";
panose-1:2 4 5 3 5 4 6 3 2 4;
mso-font-charset:0;
mso-generic-font-family:roman;
mso-font-pitch:variable;
mso-font-signature:3 0 0 0 1 0;}@font-face
{font-family:Calibri;
panose-1:2 15 5 2 2 2 4 3 2 4;
mso-font-charset:0;
mso-generic-font-family:swiss;
mso-font-pitch:variable;
mso-font-signature:-536859905 -1073732485 9 0 511 0;}p.MsoNormal, li.MsoNormal, div.MsoNormal
{mso-style-unhide:no;
mso-style-qformat:yes;
mso-style-parent:"";
margin:0cm;
mso-pagination:widow-orphan;
font-size:12.0pt;
font-family:"Calibri",sans-serif;
mso-ascii-font-family:Calibri;
mso-ascii-theme-font:minor-latin;
mso-fareast-font-family:Calibri;
mso-fareast-theme-font:minor-latin;
mso-hansi-font-family:Calibri;
mso-hansi-theme-font:minor-latin;
mso-bidi-font-family:"Times New Roman";
mso-bidi-theme-font:minor-bidi;
mso-font-kerning:1.0pt;
mso-ligatures:standardcontextual;
mso-ansi-language:ES-TRAD;
mso-fareast-language:EN-US;}MsoChpDefault
{mso-style-type:export-only;
mso-default-props:yes;
font-family:"Calibri",sans-serif;
mso-ascii-font-family:Calibri;
mso-ascii-theme-font:minor-latin;
mso-fareast-font-family:Calibri;
mso-fareast-theme-font:minor-latin;
mso-hansi-font-family:Calibri;
mso-hansi-theme-font:minor-latin;



mso-bidi-font-family:"Times New Roman";
mso-bidi-theme-font:minor-bidi;
mso-ansi-language:ES-TRAD;
mso-fareast-language:EN-US;}div.WordSection1
{page:WordSection1;}



(*)The teaching guide is the document in which the URV publishes the information about all its courses. It is a public document and cannot be modified. Only in exceptional cases can it be revised by the competent agent or duly revised so that it is in line with current legislation.