



Teaching Guide

Identifying Data					2024/25
Subject (*)	Virtualisation and Heritage Recreation	Code	614552018		
Study programme	Máster Universitario en Patrimonio Cultural Dixital				
Descriptors					
Cycle	Period	Year	Type	Credits	
Official Master's Degree	2nd four-month period	First	Optional	3	
Language	Spanish				
Teaching method	Face-to-face				
Prerequisites					
Department	Enxeñaría Civil				
Coordinador	Hernandez Ibañez, Luis Antonio	E-mail	luis.hernandez@udc.es		
Lecturers	Barneche Naya, Viviana Hernandez Ibañez, Luis Antonio	E-mail	viviana.barneche@udc.es luis.hernandez@udc.es		
Web	videalab.udc.es				
General description	Na materia describíense as diferentes fórmulas e estratexias para a recreación virtual do Patrimonio. Desde o deseño de aplicacións e instalacións museísticas ata a elaboración de exemplos funcionais. Para iso estúdanse casos existentes e exponse exercicios de aplicación nos que se describen e utilizan os fluxos de traballo e as ferramentas tecnolóxicas necesarias, con especial incidencia na visualización 3D, RV e RA.				

Study programme competences / results

Code	Study programme competences / results
A4	CON4-Knowledge about digital heritage entities, modeling and management of heritage information
A5	CON5-Knowledge about the creation and management of heritage projects in the digital environment
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
A9	CON9-Knowledge about interactive products and apps applied to dissemination and heritage education
A12	CON12-Knowledge about digital tools for organization and management of archeological heritage
A13	CON13-Knowledge about digital tools for organization and management of artistic heritage
A17	CON17-Knowledge about cataloging and digital storage systems for the organization and management of photographic, audiovisual and digital heritage
A24	CON24-Knowledge about co-creation and implementation of innovative and sustainable projects in the field of cultural heritage
A25	CON25-Knowledge about the Internet and the Web; Web applications; Mobile apps; Introduction to gamification
B2	HAB2-Be able to apply knowledge in problem solving
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
B8	DES3-Be able to work in a team with a collaborative and interdisciplinary attitude
C1	CB1. Possess and understand knowledge that provides a basis or opportunity to be original in the development and/or application of ideas, often in a research context
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
C4	CB4. That students know how to communicate their conclusions ?and the knowledge and ultimate reasons that support them? to specialized and non-specialized audiences in a clear and unambiguous way
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
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.
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	
- Coñecer as diferentes fórmulas e estratexias para a recreación virtual do patrimonio. - Coñecer as técnicas para a creación de modelos virtuais - Coñecer os formatos de visualización de modelos virtuais, descritivos, interactivos e inmersivos. - Capacidade de deseñar aplicacións e instalacións para a recreación virtual do patrimonio a través de tecnoloxías de visualización 3D, RV e RA - Coñecemento do proceso de desenvolvemento de proxectos de recreación virtual do patrimonio utilizando motores gráficos para a visualización interactiva e inmersiva.	AJ4	BJ2	CJ1
	AJ5	BJ4	CJ2
	AJ7	BJ6	CJ4
	AJ8	BJ8	CJ5
	AJ9		CJ7
	AJ12		CJ8
	AJ13		CJ10
	AJ17		CJ11
	AJ24		CJ12
AJ25		CJ15	

Contents	
Topic	Sub-topic
1.- Introducción	Fórmulas e estratexias para a recreación virtual. Musealización virtual. Museos on-line. Instalacións audiovisuais. Instalacións interactivas. Interacción natural. Estudos de casos
2.-Técnicas de obtención de modelos virtuais.	Modelado CAD, Reposición fotogramétrica. Estratexias para a obtención de modelos eficientes.
3.- Formatos de visualización de modelos virtuais	Visualización 3D. Animacion. Integración. Simulaciones interactivas. Realidad Virtual. Realidad Aumentada y Extendida.
4.- Deseño de proxectos de recreación virtual do patrimonio.	Formulación narrativa. Deseño de interacción. Interacción Natural Implementación. Deseño de instalacións museísticas virtuais
5.- Desenvolvemento de proxectos de recreación virtual.	Ferramentas de traballo. Contornas e programas de modelado e visualización 3D. Fluxo de traballo. Experimentación con motores gráficos, motores de xogo e tecnoloxías de realidade virtual e aumentada.

Planning				
Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student?s personal work hours	Total hours
Guest lecture / keynote speech	A4 A5 A7 A8 A9 A12 A13 A17 A24 A25	9	0	9
Seminar	B4 B8 C1 C12 C15	3	0	3
Supervised projects	B2 B6 C2 C4 C5 C7 C8 C10 C11	0	49	49
Mixed objective/subjective test	C2 C4 C7 C8 C11 C15	1	0	1
Laboratory practice	A25 B2 B4 B6 C8	11	0	11
Personalized attention		2	0	2

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

Methodologies



Methodologies	Description
Guest lecture / keynote speech	Exposición dun tema por parte do profesor.
Seminar	Traballo colaborativo entre los estudiantes, guiado por el profesor, de cara a obtener una solución razonada y debatida a un problema planteado.
Supervised projects	Realización dun traballo que poña en práctica os coñecementos adquiridos.
Mixed objective/subjective test	Realización dun exercicio teórico-practico nun tempo determinado.
Laboratory practice	Aprendizaxe das ferramentas necesarias para a posta en práctica dos coñecementos adquiridos. Experimentación con exemplos.

Personalized attention

Methodologies	Description
Laboratory practice Seminar Supervised projects	Asistencia ao alumno na resolución de dúbidas durante a realización das súas prácticas de laboratorio. Corrección e asesoramento continuos ao estudante durante a realización do seu traballo persoal Estas metodoloxías tamén estarán a dispor do alumnado con recoñecemento de dedicación a tempo parcial e dispensa académica de exención de asistencia.

Assessment

Methodologies	Competencies / Results	Description	Qualification
Laboratory practice	A25 B2 B4 B6 C8	Realización de exemplos prácticos no laboratorio supervisados polo profesor.	30
Supervised projects	B2 B6 C2 C4 C5 C7 C8 C10 C11	Realización dun traballo de curso consistente nun exemplo de recreación virtual do patrimonio. Ponderarase a calidade e compleción do mesmo e a memoria descritiva e (30 pts) a súa exposición (10 pts)	40
Mixed objective/subjective test	C2 C4 C7 C8 C11 C15	Realización dunha proba escrita que avalía os coñecementos teóricos adquiridos polo estudante.	30

Assessment comments

Todos os aspectos relacionados con ?dispensa académica?, ?dedicación ao estudo?, ?permanencia? e ?fraude académica? rexeranse de acordo coa normativa académica vixente da UDC.

Sources of information



Basic	<p>- () .</p> <p>- Jiménez, D. (2017) Arqueología Computacional. Nuevos enfoques para la documentación, análisis y difusión del patrimonio cultural. Instituto Nacional de Antropología e Historia. Mexico. 2017- Greengard, S. (2019) Virtual Reality. The MIT Press- Moll, A. (2017) The Interactive Past : Archaeology, Heritage, and Video Games. Leiden Sidestone Press- Virtual Archaeology Review (VAR) . Journal. Ed. Polipapers. Valencia.- Schmalstieg , D., Höllerer, T., (2016) Augmented Reality: Principles andPractice, Addison-Wesley Professional.- Mendez, R., Otero, A., Jarque, S., Flores, J., 2012, ?Exploración en tiemporeal de la reconstrucción virtual de los instrumentos del Pórtico de laGloria?, VAR (Virtual Archeology Review), Vol. 3, pp. 49-53, ISSN 1989-9947.- Otero, A., Méndez, R., Flores, J., ?Pórtico de la Gloria Virtual?, VAR(Virtual Archeology Review), Vol. 3, pp. 18-23, ISSN 1989-9947.- Barneche,V., Hernández, L. (2021) A comparative study on user gestural inputs for navigation in NUI-based 3D virtual environments. Universal Access in the Information Society International Journal. 20, pp. 513 - 529. Springer, ISSN 1615-5289- Hernández, L., Barneche, V. (2016) Assisted navigation and natural interaction for virtual archaeological heritage. Implementation of an attractor-based approach using a game engine. Mediterranean Archaeology & Archaeometry. 16 - 5, pp. 43 - 51. Rhodes ISSN 1108-9628- Barneche, V., Hernandez, L. (2015). Evaluating User Experience in Joint Activities between Schools and Museums in Virtual Worlds. Universal Access in the Information Society. 14 - 3, pp. 389 - 398. Springer, ISSN 1615-5289- Hernandez, L., Barneche, V. Contextualization of Archaeological Findings using Virtual Worlds. Issues on Design and Implementation of a Multiuser Enabled Virtual Museum. Learning and Collaboration Technologies. 91/92, pp. 384 - 394. Springer, 2015. ISSN 1611-3349- Barneche, V., Hernández, L., Jaspe, A., Fariña G. (2012). Aplicación para la inspección espacial, volumétrica y seccional interactiva de la Catedral de Santiago de Compostela.Virtual Archaeology Review. 3 - 6, pp. 78 - 82. ISSN 1989-9947</p>
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 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.