



## Teaching Guide

Identifying Data					2020/21
<b>Subject (*)</b>	Rehabilitation Techniques for Buildings	<b>Code</b>	630567115		
<b>Study programme</b>	Mestrado Universitario en Rehabilitación Arquitectónica (Plan 2016)				
Descriptors					
Cycle	Period	Year	Type	Credits	
Official Master's Degree	2nd four-month period	First	Obligatory	3	
<b>Language</b>	SpanishGalicianEnglish				
<b>Teaching method</b>	Face-to-face				
<b>Prerequisites</b>					
<b>Department</b>	Construcións e Estruturas Arquitectónicas, Cívicas e Aeronáuticas				
<b>Coordinador</b>	Rodríguez Cheda, Jose Benito	<b>E-mail</b>	jose.benito.rodriguez.cheda@udc.es		
<b>Lecturers</b>	Hermo Sanchez, Víctor Manuel	<b>E-mail</b>	victor.hermo@udc.es		
	Rodríguez Cheda, Jose Benito		jose.benito.rodriguez.cheda@udc.es		
<b>Web</b>					
<b>General description</b>	Theoretical Exposition, analysis and practices of specific construction techniques of intervention on the architectural rehabilitation: contamination, biological colonization and cleaning of facades; the consolidation of the stone; the rehabilitation of facades of reinforced concrete and prefabricated; of the woodwork of modern architecture; enclosures from outside, paints and coatings; demolitions, formwork and auxiliary means, etc. Classes uses the "case method", consist the exposure of different techniques of analyzing a unique building.				
<b>Contingency plan</b>	<ol style="list-style-type: none"> <li>1. Modifications to the contents</li> <li>2. Methodologies <ul style="list-style-type: none"> <li>*Teaching methodologies that are maintained</li> <li>*Teaching methodologies that are modified</li> </ul> </li> <li>3. Mechanisms for personalized attention to students</li> <li>4. Modifications in the evaluation <ul style="list-style-type: none"> <li>*Evaluation observations:</li> </ul> </li> <li>5. Modifications to the bibliography or webgraphy</li> </ol>				

## Study programme competences

Code	Study programme competences
A1	E01 - Aptitude ou capacidade para acometer actividades de crítica arquitectónica, mediante a análise do patrimonio edificado baixo diferentes ópticas e a identificación dos precedentes formais, tipolóxicos e estilísticos.
A2	E02 - Aptitude ou capacidade para realizar tarefas vinculadas á protección do patrimonio edificado, incluídas a catalogación monumental, a definición de medidas de protección de edificios e conxuntos arquitectónicos, e a redacción de plans de delimitación e conservación.
A3	E03 - Aptitude ou capacidade para elaborar o material gráfico asociado ao levantamento, a análise, a interpretación e a intervención do patrimonio arquitectónico.
A4	E04 - Aptitude ou capacidade para intervir no patrimonio edificado con valor histórico, aspecto que engloba a coordinación do seu estudo e a súa investigación documental, a elaboración de plans directores de conservación e a redacción e dirección da execución de proxectos de restauración e rehabilitación.
A5	E05 - Aptitude ou capacidade para a conservación da obra pesada, mediante a inspección, a análise, o control de calidade, a definición das condicións de mantemento e a estimación da seguridade das estruturas de edificación, incluídas as súas posibles cimentacións, podendo igualmente afrontar a redacción de proxectos de reparación e reforzo, e a dirección da execución asociada.



A6	E06 - Aptitude ou capacidade para inspeccionar, analizar, controlar a calidade e definir as condicións de mantemento, e intervir nas instalacións de edificación.
A7	E07 - Aptitude ou capacidade para a conservación da obra grosa e acabada, cuestión que comporta a inspección, a análise, o control de calidade, a definición das condicións de mantemento e a intervención nos sistemas construtivos de edificación, incluídos os elementos de compartimentación interior, as carpintarías e as solucións de envolvente.
A8	E08 - Aptitude ou capacidade para redactar informes técnicos e proxectos de rehabilitación do patrimonio edificado, incluídas actividades de asesoramento e consultoría.
A9	E09 - Aptitude ou capacidade para realizar auditorías e certificacións enerxéticas de edificios existentes, incluída a proposta de alternativas de mellora e optimización mediante a redacción de informes e proxectos técnicos.
A10	E10 - Aptitude ou capacidade para utilizar criterios de sustentabilidade ambiental na elección de materiais e na definición de solucións técnicas, abranguendo o uso e a integración de sistemas activos e pasivos.
B1	CB6 - Posuír e comprender coñecementos que proporcionen unha base ou oportunidade para ser orixinais no desenvolvemento e/ou a aplicación de ideas, a miúdo nun contexto de investigación.
B2	CB7 - Que os estudantes saiban aplicar os coñecementos adquiridos e a súa capacidade de resolución de problemas en contornos novos ou pouco coñecidos dentro de contextos máis amplos (ou multidisciplinares) relacionados coa súa área de estudo.
B3	CB8 - Que os estudantes sexan capaces de integrar coñecementos e enfrontarse á complexidade de formular xuízos a partir dunha información que, sendo incompleta ou limitada, inclúa reflexións sobre as responsabilidades sociais e éticas vinculadas á aplicación dos seus coñecementos e xuízos.
B4	CB9 - Que os estudantes saiban comunicar as súas conclusións e os coñecementos e as razóns últimas que as sustentan a públicos especializados e non especializados dun modo claro e sen ambigüidades.
B5	CB10 - Que os estudantes manexen as habilidades de aprendizaxe que lles permitan continuar estudando dun modo que haberá de ser en gran medida autodirixido ou autónomo.
B6	CG1 - Entender a importancia da rehabilitación arquitectónica desde o punto de vista da preservación do patrimonio histórico e cultural dunha sociedade.
C1	T01 - Capacidade de análise e síntese
C2	T02 - Capacidade de organización e planificación
C3	T03 - Comunicación oral e escrita
C4	T04 - Coñecementos de informática relativos ao ámbito de estudo
C5	T05 - Capacidade para a xestión da información
C6	T06 - Resolución de problemas
C7	T07 - Toma de decisións
C8	T08 - Aprendizaxe autónoma
C9	T09 - Creatividade
C10	T10 - Habilidade gráfica xeral
C11	T11 - Visión espacial
C12	T12 - Comprensión numérica
C13	T13 - Intuición mecánica
C14	T14 - Sensibilidade estética
C15	T15 - Cultura histórica

## Learning outcomes

Learning outcomes	Study programme competences
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Knowledge of the techniques, materials, elements and building systems in architectural rehabilitation, its history, characteristics, regulations and its application to architecture.	AJ1	BJ1	CJ1
	AJ2	BJ2	CJ2
	AJ3	BJ3	CJ3
	AJ4	BJ4	CJ4
	AJ5	BJ5	CJ5
	AJ6	BJ6	CJ6
	AJ7		CJ7
	AJ8		CJ8
	AJ9		CJ9
	AJ10		CJ10
			CJ11
			CJ12
			CJ13
			CJ14
			CJ15
Training of the student so that he can design, measure and specify specific construction details of the architectural rehabilitation techniques and systems.	AJ1	BJ1	CJ1
	AJ2	BJ2	CJ2
	AJ3	BJ3	CJ3
	AJ4	BJ4	CJ4
	AJ5	BJ5	CJ5
	AJ6	BJ6	CJ6
	AJ7		CJ7
	AJ8		CJ8
	AJ9		CJ9
	AJ10		CJ10
			CJ11
			CJ12
			CJ13
			CJ14
			CJ15
Training of the student so that he can design, measure and specify specific construction details of the architectural rehabilitation techniques and systems.	AJ1	BJ1	CJ1
	AJ2	BJ2	CJ2
	AJ3	BJ3	CJ3
	AJ4	BJ4	CJ4
	AJ5	BJ5	CJ5
	AJ6	BJ6	CJ6
	AJ7		CJ7
	AJ8		CJ8
	AJ9		CJ9
	AJ10		CJ10
			CJ11
			CJ12
			CJ13
			CJ14
			CJ15

Contents	
Topic	Sub-topic



Theme 0. To train students so that you can address the architectural project from specific construction techniques of architectural rehabilitation.	Grados de intervención. Patrimonio construído. Tradiciones constructivas. Criterios de intervención. La rehabilitación arquitectónica hoy; una aproximación.
Theme 1. Previous actions in the architectural rehabilitation.	Emergency actions. Consolidation of facades. Formwork. Shoring. Ansdamios.
Theme 2. Fouling and cleaning of facades	Fouling. Fouling by biological colonization. Façade cleaning.
Theme 3. Rehabilitation of facades.	Rehabilitation of facades from the outside: exterior thermal insulation (REVIT) systems. Rehabilitation with constructive elements. new terraced facades. Case studies.
Topic 4. Rehabilitation of concrete architectures.	Cleaning. Passivation of armor. Protection of armadouras. Products. Protection of concrete.
Item 5. Rehabilitation of decks.	Covered skirts. Flat roofs. Industrialized products.
Item 6. Rehabilitation of floor slabs.	Industrial systems and products. Case studies.
Item 7. Refurbishment of the exterior carpentry.	Woodworks. Steelwork. Case studies.
Tema 8. Rehabilitation of facade	Rehabilitation of continuous coatings: mortars, plastered, and stucco. Facings. Industrial panels.
Item 9: Comprehensive case studies of architectural rehabilitation.	Actuaciones en las cubiertas de la Catedral de Santiago de Compostela. Arq. J. Alonso. Plan director de la Catedral de Santiago de Compostela. Arq. J. Alonso. Actuaciones arquitectónicas en el Pórtico de la Gloria de la Catedral de Santiago de Compostela. Arq. S. Seara.
Tema 10: Casos prácticos integrales de rehabilitación arquitectónica del patrimonio histórico 2.	Casa de las Conchas en Salamanca. Arq. C. Puente. Colegio Fonseca Salamanca. Arq. C. Puente.
Tema 11: Casos prácticos integrales de rehabilitación arquitectónica del patrimonio moderno	Casa de la Cultura de Cambre. AZrq, Ezcurra y Ouzande. Villa Ricarda. Arq. A. Bonet Correa

Planning				
Methodologies / tests	Competencies	Ordinary class hours	Student?s personal work hours	Total hours
Guest lecture / keynote speech	A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 B1 B2 B3 B4 B5 B6 C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15	18	18	36
Supervised projects	A1 A2 A3 A4 A5 A6 A7 A8 A10 B3 B4 B5 B6 C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15	3	21	24



Workbook	A1 A2 A3 A4 A5 A6 A7 A8 A10 B3 B4 B5 B6 C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15	1	9	10
Personalized attention		5	0	5
(*)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	Exhibition in the classroom of the corresponding agenda item. At the beginning of the session the index and summary of the topic will be displayed. The explanation with the required images and diagrams and convenient summary tables will be supported. At the end of the session a summary highlighting the most important aspects will be made and the relevant complementary readings will be recommended.
Supervised projects	<p>"Supervised projects": elaboration by the student of a working professional or research." Methodology designed to promote autonomous learning of students, under the tutelage of Professor, in various scenarios (academic and professional). Primarily refers to the learning of the "how to do things". It is a choice based on the assumption by the students of the responsibility for their own learning and in the monitoring of the learning by the tutor. Protected work will focus on direct content of the matter or that are related in the opinion of Professor. Work may arise as unique and independent work or, preferably, may form part of the end of Master work, as it is the case with the rest of the materials of the construction Area."</p> <p>During the course there will be a practical work consisting of constructive development - memory, plans and technical specifications - from the renovation of an existing building. Work will be raised at the beginning of the course and it will be the proposed buildings to serve as exercise to other subjects of the Master. Also more theoretical work topics of the type will be proposed: assessment and comparative study of materials and systems for architectural rehabilitation.</p>
Workbook	Los estudiantes leer libros, artículos científicos y técnicos y documentación que demuestre los profesores.

Personalized attention	
Methodologies	Description
Guest lecture / keynote speech	The importance of personalized attention is a consequence of targets teachers of the subject consisting of not only inform or communicate a more or less objective content, but form: develop skills, ways to deal with the problems, stimulating creativity, critical thinking, etc. Personalized student attention will take place during the performance of protected works, through personal interviews with the teacher.
Supervised projects	

Assessment			
Methodologies	Competencies	Description	Qualification
Guest lecture / keynote speech	A1 A2 A3 A4 A5 A6 A7 A8 A9 A10 B1 B2 B3 B4 B5 B6 C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15	There will be no exams in the subject. To overcome the course is an essential condition given lectures all to attend and present the notes taken of the subject for evaluation. The assistance will be checked. Any lack in attendance, justified, must be restored through a work consisting of a reading indicated by the teacher who must be accompanied by the corresponding written summary.	30



Supervised projects	A1 A2 A3 A4 A5 A6 A7 A8 A10 B3 B4 B5 B6 C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15	To overcome the course is indispensable condition the realization and presentation of a work of course. This work must obtain a minimum score of approved.	65
Workbook	A1 A2 A3 A4 A5 A6 A7 A8 A10 B3 B4 B5 B6 C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15	To overcome the course is indispensable condition the realization and presentation of a work of course. This work must obtain a minimum score of approved.	5

### Assessment comments

A esixencia xeral de asistencia non terá efecto có alumnado que teña recoñecida unha dedicación a tempo parcial según a Norma que regula o réxime de dedicación ao estudo e a permanencia e a progresión dos estudantes de grao e mestrado universitario na UDC. O seguemento do curso e a autoría verificarase có cumprimento de tutorías obrigatorias.

### Sources of information

<b>Basic</b>	MALDONADO RAMOS, L.; Técnicas de intervención en edificios históricos (TIEH), Instituto Juan de Herrera, Escuela Técnica Superior de Arquitectura de Madrid, 2001. MONJO CARRIÓ, J.; Patología de cerramientos y acabados arquitectónicos, Munilla-Lería, 2000. MONJO CARRIÓ, J.; MALDONADO RAMOS, L.; Manual de inspección técnica de edificios, Munilla-Lería, 2002. DEPARTAMENTO DE CONSTRUCCIÓN Y TECNOLOGÍAS ARQUITECTÓNICAS, Tratado de rehabilitación, Munilla-Lería, 1999. VILLEGAS SÁNCHEZ, R.; Metodología de diagnóstico y evaluación de tratamientos para la conservación de los edificios históricos, Instituto Andaluz de Patrimonio Histórico, ed. Comares, 2003. PARICIO ANSUÁTEGUI, I.; Pátina o suciedad, ed. Bisagra, 2002.
<b>Complementary</b>	TECTÓNICA 18; Rehabilitación (I): estructuras, Madrid 2005. TECTÓNICA 33; Rehabilitación: la arquitectura moderna , Madrid 2010.

### Recommendations

#### Subjects that it is recommended to have taken before

Modern Architectural Actions and Strategies/630567102  
Materials deterioration and traditional building technology/630567113  
Structural Analysis of Historical Buildings/630567118  
Architectural Heritage: Theory and Analysis/630567101  
Restoration Project: Concept and Method/630567107

#### Subjects that are recommended to be taken simultaneously

Damage and Restoration of Wooden Structures/630567121  
Damage and Restoration of Concrete Structures/630567120  
Construction Assemblies Inspection/630567109  
Damage and Restoration of Stonework Structures/630567122

#### Subjects that continue the syllabus

Advanced Structural Repair and Reinforcement Systems/630567123

#### 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.