



## Teaching Guide

Identifying Data					2017/18
Subject (*)	Assessment and underpinning of foundations	Code	630567119		
Study programme	Mestrado Universitario en Rehabilitación Arquitectónica (Plan 2016)				
Descriptors					
Cycle	Period	Year	Type	Credits	
Official Master's Degree	2nd four-month period	First	Obligatoria	3	
Language	Spanish				
Teaching method	Face-to-face				
Prerequisites					
Department	Construcións e Estruturas Arquitectónicas, Cívicas e AeronáuticasEnxeñaría Civil				
Coordinador	Perez Valcarcel, Juan Bautista	E-mail	juan.pvalcarcel@udc.es		
Lecturers	Perez Valcarcel, Juan Bautista	E-mail	juan.pvalcarcel@udc.es		
Web	www.gea-udc.es/?page_id=643				
General description	It is intended that the student is qualified to can make the diagnostic with solvency for the problems that can cause the soil on the rehabilitation work and propose safe, viable and suitable solutions to the architectural design within the rehabilitation project. For that, it is necessary the precise knowledge referred to the recognition of soils, the diagnosis of pathology linked to the ground and the basic and advanced techniques, what will be exposed in the classes of theory. At the time the student must know how to translate this knowledge into concrete techniques, for which they propose a series of practical classes and the accomplishment of a concrete work. This work should be related to the professional activity of the architect, within the specific content of this subject.				

## Study programme competences / results

Code	Study programme competences / results
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.
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.
A8	E08 - Aptitude ou capacidade para redactar informes técnicos e proxectos de rehabilitación do patrimonio edificado, incluídas actividades de asesoramento e consultoría.
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.
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
C11	T11 - Visión espacial
C12	T12 - Comprensión numérica
C13	T13 - Intuición mecánica
C15	T15 - Cultura histórica

Learning outcomes			
Learning outcomes	Study programme competences / results		
Understanding a geotechnical report		BJ2	CJ6 CJ7 CJ8
To be able to diagnose the pathologies caused by the soil or the foundations	AJ1	BJ3 BJ4 BJ5	CJ1 CJ2 CJ3 CJ4 CJ5 CJ15
To be able to value foundations already built	AJ5 AJ8	BJ1 BJ4	
Design and calculate all kinds of underpinning and foundation reinforcements	AJ1	BJ1 BJ2	CJ9 CJ11 CJ12 CJ13
Know and know how to use soil improvement techniques			CJ1 CJ2 CJ6 CJ7 CJ8 CJ12 CJ13

Contents	
Topic	Sub-topic
Inspection of foundations in building	Pathology of soils. Pathology of foundations. Pathology of excavations. Pathology of retaining walls. Slurry wall pathology.



Foundation Inspection and Validation: Soil Exploration Methods	METHODS OF SOIL INSPECTION Calico Boreholes. Penetrometers. Geophysical tests METHODS OF INSPECTION OF FOUNDATIONS Inspection and recording of movements. Inspection and registration of cracks. Analysis of the observed pathology. Study of the terrain, foundation and causes of failure. Verification of hypotheses and differential diagnosis. Selection of solutions. Execution of the work of underpinning or reinforcement.
The underpinning in the building.	General concepts. Shoring. Superficial underpinning.
Underpinning with added elements.	Underpinning with piles. Underpinning with micropiles.
Soil improvement techniques	Soil improvement. Foundations on expansive soils. Foundations on collapsible soils. Foundations on fillings.
The project of underpinning	The decision to underpinning. Choice of underpinning system. Execution of the project of underpinning: Plans, memory, specifications, measurements and budget. The work direction of underpinning.

Planning				
Methodologies / tests	Competencies / Results	Teaching hours (in-person & virtual)	Student?s personal work hours	Total hours
Objective test	A1 A5 A8 B1 B2 B3 B4 B5 C1 C2 C3 C4 C5 C6 C7 C8 C9 C11 C12 C13 C15	0	45	45
Supervised projects	A5 B1 B2 B3 C8 C7 C6 C5 C4 C3 C2 C1 C9 C11 C12 C15	4	4	8
Guest lecture / keynote speech	A1 B3 B2 C1 C3 C6 C9 C12 C13 C15	21	0	21
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
Objective test	Making a global practice
Supervised projects	Performing at least two partial practices
Guest lecture / keynote speech	Teacher's Explanation



## Personalized attention

Methodologies	Description
Objective test	A lo largo del curso se solucionarán las dudas planteadas

## Assessment

Methodologies	Competencies / Results	Description	Qualification
Supervised projects	A5 B1 B2 B3 C8 C7 C6 C5 C4 C3 C2 C1 C9 C11 C12 C15	Partial Practices	20
Objective test	A1 A5 A8 B1 B2 B3 B4 B5 C1 C2 C3 C4 C5 C6 C7 C8 C9 C11 C12 C13 C15	Global practice of the subject	50
Guest lecture / keynote speech	A1 B3 B2 C1 C3 C6 C9 C12 C13 C15	Regular attendance and participation in the development of theoretical classes	30
Others			

## Assessment comments

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## Sources of information

<b>Basic</b>	Bibliografía básica - Jiménez Salas, J. et alii "Geotecnia y cimientos". Editorial Rueda. Madrid 1981. - Rodríguez Ortiz, J.M. "La cimentación". Curso de Rehabilitación. Colegio Oficial de Arquitectos de Madrid. Madrid 1984. - Pérez Valcarcel J. "Excavaciones urbanas y estructuras de contención". Ediciones CAT. Colegio Oficial de Arquitectos de Galicia. Santiago 2005. - González Caballero, M. "El terreno". Ediciones UPC. Barcelona 2001. Bibliografía complementaria - González de Vallejo, L.; Ferrer, M.; Ortuño L.; Oteo, C. "Ingeniería geológica". Prentice Hall. Madrid. 2002. - Tomlinson, M.J. "Diseño y construcción de cimientos". Ediciones Urmo. Bilbao 1982. - Braja M. Das "Principios de ingeniería de cimentaciones?". Ed Thomson. Méjico 2006.
<b>Complementary</b>	

## Recommendations

<b>Subjects that it is recommended to have taken before</b>
Building Inspection/630567110
<b>Subjects that are recommended to be taken simultaneously</b>
Materials deterioration and traditional building technology/630567113
<b>Subjects that continue the syllabus</b>
Damage and Restoration of Concrete Structures/630567120
<b>Other comments</b>

(\*)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.