

Rehabilitation Techniques for Old Structures

Academic Year:

2018/2019

Course	Master's degree in Conservation and Rehabilitation								
Scientific Area	Conservation and Rehabilitation								
ECTS Credits	6,5	Curriculum Unit code	TREA	Year	1	Semester	2	Type	Compulsory
Prerequisites									
Contact Hours:									
Lecture Sessions		Lecture-Practical Sessions	45	Practical and Laboratory Sessions					
Tutorial		Placement		Seminar					
Fieldwork		Other	7,5	Autonomous Study	123				
Responsible	Ana Maria C. Aires P. Silva Bártolo			Position	Visiting Adjunct Professor				
Lecturers				Position					
Learning Outcomes	To learn techniques of repairing old structures, with an introduction to techniques of reinforcement of old structures of masonry and wood. Introduction to simplified methods of analysis of the structural capacity of structures and evaluation of the need for structural rehabilitation. To acquire knowledge related to rehabilitation and reinforcement techniques.								
Syllabus	<ol style="list-style-type: none"> 1. Structural Evaluation of Old Buildings. Objectives and difficulties. Structural anomalies. Legislative framework 2. Global and Local Safety Assessment 3. Rehabilitation Intervention Strategies 4. Structural Solutions, Techniques of repair and structural reinforcement with low intrusion: <ol style="list-style-type: none"> a) Reinforcement techniques to improve the behavior of old masonry and wood buildings to horizontal actions. b) Structural Rehabilitation techniques for masonry structures c) Structural Rehabilitation Techniques of Wood Structures d) Structural Rehabilitation Techniques of Composite Buildings e) Structural Rehabilitation Techniques of Foundations 								
Teaching Methodologies	The classes are mostly theoretical-practical. In the first classes of each chapter, the fundamentals necessary to the understanding of the subjects are presented, with the aid of slides and review of papers. In the remaining classes, students will solve practical cases, either individually or in groups.								
Evaluation	The evaluation will be done through the accomplishment of works and final test / exam: Test / Exam - minimum mark 8.0 values, weight 40%. Works - minimum grade 9.50 values, weight 60%. Special season and monthly exam: minimum mark 9.50 values, weight 100%.								

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Evidence of the syllabus coherence with the curricular unit's intended learning outcomes

The main aim of the curricular unit is to enable students to acquire scientific knowledge in order to know how choose and design different types of structural reinforcement of old buildings. This syllabus encompasses, on the one hand, fundamental scientific concepts for a good structural design and their design, and on the other hand, a practical learning of the current regulation manuals and technical catalogs.

Evidence of the teaching methodologies coherence with the curricular unit's intended learning

As the fundamental objective of the curricular unit is the development of competences that allow the student to diagnose structural pathologies and, additionally, to propose and to design structural reinforcement solutions, the methodology is fundamentally theoretical-practical. The classes explore the scientific concepts, by first presenting it and then applying the concepts through proposed practical exercises. At the same time, the students will develop structural reinforcement solutions applied to practical works.

Bibliography

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PINHO, Fernando F. S. (2001), "Paredes de edifícios antigos em Portugal", Vol. 8, 3ª edição, col. "Edifícios - Conservação e Reabilitação", LNEC, Lisboa
LOURENÇO, Paulo B. (2002), "Aspectos Sobre a Construção em Alvenaria Estrutural", Congresso Nacional Estruturas 2002 - "Os Novos Desafios na Qualidade das Obras", APPE, LNEC, Lisboa
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"Eurocode 5: Design of timber structures - Part 1-1: General -Common rules and rules for buildings". CEN, EN 1995-1-1
"Eurocode 6 - Design of Masonry Structures - Part 1-1: General Rules for Buildings - Rules for reinforced and unreinforced masonry". CEN, EN 1996-1-1

Observations