IPS Instituto Politécnico de Setúbal
Escola Superior de Tecnologia do Barreiro

Curriculum Unit Sheet

Conservation and Rehabilitation I

Academic Year:

2018/2019

Course	Master's degree in Civil Engineering								
Scientific Area	Construction								
ECTS Credits	5.5	**Curriculum Unit code**	MEC043	**Year**	1	**Semester**	1	**Type**	Compulsory
Prerequisites									

Contact Hours

Lecture Sessions		**Lecture-Practical Sessions**	37.5	**Practical and Laboratory Sessions**	7.5
Tutorial	7.5	**Placement**		**Seminar**	
Fieldwork		**Other**	7.5	**Autonomous Study**	88.5

Responsible	Maria Eugénia de Jesus Santos	**Position**	Adjunct Professor
Lecturers		**Position**	

Learning Outcomes

Students should acquire basic knowledge in the domain of the conservation and rehabilitation of old buildings (i.e. before the advent of reinforced concrete), in order to enable them to: identify and describe the materials and the construction processes of old constructions, identify the damages and enumerate the probable causes of degradation, describe the different deterioration mechanisms, define the methodology of tests and inspections and analysis of an old structure, define the objectives of a rehabilitation intervention, select the appropriate rehabilitation techniques and specify the properties of the products and systems to be applied, regarding the requirements of the habitation rehabilitation, the principles for the analysis, conservation and structural restoration of old buildings and architectural heritage and the International Charters and Resolutions.

Syllabus

Chap. 1. Introduction to general concepts (old building, conservation, rehabilitation, heritage). Phases of a rehabilitation project. International Charters and Resolutions.
Chap. 2 Old buildings: Development of construction. processes and materials characteristic of old buildings constructions. Classification of buildings according to the time of construction.
Chap. 3. Characterization of constructive elements of old buildings. Walls and their coatings. Floors and coverings. Foundations.
Chap. 4. Major anomalies in old buildings. Structural and non-structural pathologies. Safety in use. Material's degradation of materials. Humidity and cracking.
Chap. 5. Wood pathologies. Major anomalies in wooden elements of old buildings.
Chap. 6. Diagnosis of pathology. Inspection's methodologies. Destructive and non-destructive techniques. Test procedures in situ and laboratory. Structural safety.
Chap. 7. Improvement of living conditions and safety. Rehabilitation methods. Thermal behaviour. Humidity protection. Fire safety.
Chap. 8. Analysis of cases studies. Survey, inspection and tests. Establishment of the diagnosis of the causes. Presentation of rehabilitation solutions.

Teaching Methodologies

The teaching methodologies used are based on the expository method, using audiovisual media, to the theoretical contents complemented with the analysis of case studies related to constructive pathology with the technologies, the design and the execution of maintenance and rehabilitation works.
Case studies. A script will be prepared, by the Professor, with specific guidelines for the development of practical work. Throughout the semester, these will be accompanied by the teacher to clarify doubts and to foster critical analysis, developing the technical autonomy.
Conducting study visits to conservation or rehabilitation works. Technical seminars.
E-learning activities will be encouraged to research, analysis and comment on themes related to the syllabus.

Evaluation

100% Continuous evaluation or 100% Exam. Continuous evaluation: group work (90%) and e-learning activities (10%).

Evidence of the syllabus coherence with the curricular unit's intended learning outcomes	The knowledge of the built heritage, the mechanisms of degradation of buildings, materials and intervention technologies are fundamental to the practice of engineering acts related to the maintenance and rehabilitation of buildings. The syllabus of the course allow you to develop the skills of students in the areas considered essential under the maintenance and rehabilitation of buildings, including giving them the knowledge and skills required to describe and characterize the materials and construction processes, define the objetives and methodologies of assistance, select appropriate rehabilitation and maintenance techniques.
Evidence of the teaching methodologies coherence with the curricular unit's intended learning outcomes	The teaching methodology employed allows students a solid theoretical training in the areas of maintenance and rehabilitation of buildings, coupled with the ability to intervene in the resolution of practical cases. The achievement of the goals set forth is based on expository method, as the main form of transmission of theoretical knowledge and practical case analysis, in particular applied to group work on specific cases, observed in buildings in service or under construction.
Bibliography	AGUIAR, José; CABRITA, Reis; APPLETON, João – Guião de apoio à reabilitação de edifícios habitacionais. (2 vols). NS 78. Lisboa, LNEC, 2011 (8ª edição). APPLETON, João, Reabilitação de edifícios antigos - Patologias e tecnologias de Intervenção - Edições Orion, 2003. Freitas, V.; et all – Manual de Apoio ao Projeto de Reabilitação de Edifícios Antigos, Ordem dos Engenheiros da Região Norte, 2012, (1ª edição). LNEC; Documentos Introdutórios do 1º Encontro sobre conservação e reabilitação de edifícios. OERN – Manual de apoio ao projeto de reabilitação de edifícios antigos. Porto, 2012. PAIVA, José; AGUIAR, José; PINHO Ana, Guia Técnico de Reabilitação Habitacional, INH/LNEC, 1ª Edição 2006. PATORREB 2009 – 3º Encontro sobre patologia e reabilitação de edifícios PINHO, Fernando F. S., Paredes de edifícios antigos em Portugal, LNEC, Lisboa, 2000. VEIGA, Rosário; AGUIAR, José, Cadernos Edifícios 2: Revestimentos de paredes em edifícios antigos, LNEC, 2002.
Observations	