

Heritage Building Surveying Techniques

Academic Year:

2018/2019

Course	Master's degree in Conservation and Rehabilitation				
Scientific Area	Conservation and Rehabilitation				
ECTS Credits	6,0	Curriculum Unit code	TLPE	Year	1
				Semester	1
				Type	Compulsory
Prerequisites					
Contact Hours:					
	Lecture Sessions		Lecture-Practical Sessions	45	Practical and Laboratory Sessions
	Tutorial		Placement		Seminar
	Fieldwork		Other	7,5	Autonomous Study
				109,5	
Responsible	José Miguel Baio Dias			Position	Adjunct Professor
Lecturers				Position	
Learning Outcomes	<p>The student must take knowledge of different survey techniques of built heritage, namely to be able to use topographic equipment for both architectural survey as for support for topographic monitoring, photogrammetry techniques, namely Remotely Piloted Aircraft System (RPAS)), and still be aware of other techniques such as 3D laser scanning technology.</p> <p>It is also intended that the student obtain knowledge of the application of the BIM (Building Information Modeling) methodology for conservation and rehabilitation projects of the built heritage</p>				
Syllabus	<p>Chapter 1 - Topography: Observable Quantities and Observation Equipment; Geometric and Trigonometric Leveling; Transport of Coordinates; Topographic Survey; Displacement Controls and Topographic Monitoring.</p> <p>Chapter 2 - Photogrammetry: Digital images and image optimization techniques; Processing, Orientation and Rectification; Photogrammetric Surveys by Remotely Piloted Aircraft System (RPAS) and 3D Laser Scanning Technology.</p> <p>Chapter 3 - BIM Methodology for Conservation and Building Rehabilitation projects: environment, objects, templates and parametric modeling; application to the built heritage.</p>				
Teaching Methodologies	<p>Theoretical-practical classes where, after addressing the themes, exercises are solved on the subject taught, and practical work is done. In the classes the student should learn the methodologies of use and calculation to later, individually or in group, apply the concepts in the execution of practical work. The practical work consists in the execution of the survey of a structure built using topographic equipment (level and electronic tachometer), and by photogrammetric techniques using a RPAS. The student should also integrate these works in programs of automatic drawing and use BIM technology to integrate other projects necessary for the accomplishment of architectural rehabilitation.</p>				
Evaluation	<p>The evaluation will be carried out by the execution and presentation of practical work, individual or group.</p>				

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

It is the objective of the curricular unit: the development of competences that allow the student to acquire scientific and professional knowledge in order to use topographic and photogrammetric, surveying techniques and their integration in BIM environment, and other components with a view to developing a project of architectural rehabilitation.

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

The teaching methodology is based on the presentation of the theoretical contents in the classroom and practical application. The practical work, duly accompanied by the teacher, allows the student to acquire skills in the different surveying techniques, in the rehabilitation area of the building.

Bibliography

CASACA, João; MATOS, João; BAIQ, Miguel — Topografia Geral — 4ª (atualizada e aumentada) edição, Lisboa, Lidel Edições Técnicas, setembro, 2005, 9727573998.
Luhmann, Thomas; Robson, Stuart; Kyle, Stephen — Close Range Photogrammetry: Principles, Techniques and Applications: Principles, Methods and Applications — Whittles Publishing, 2006, 1-870325-50-8.
Coelho, Luiz; Brito, Jorge Nunes — Fotogrametria Digital — Editora da Universidade do Estado do Rio de Janeiro, 2007, 978-85-7511-114-7.
Eastman C., Teicholz P., Sacks R., Liso K. ; "BIM Handbook: a guide to Building Information Modeling for Owners, Managers, Engineers and Contractors, John Wiley & Sons, 2011;
García, José — "Revit 2015 & Revit LT 2015 – Curso Completo" - Edições FCA, 2014.

Observations