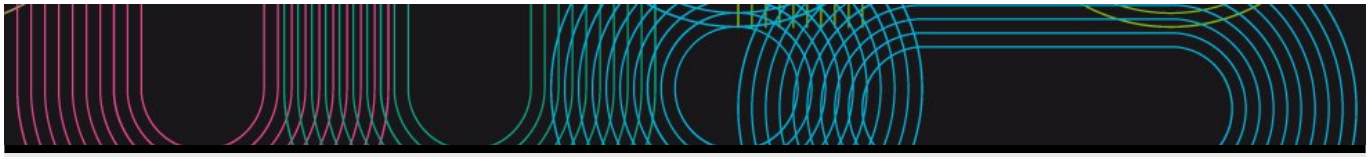

IDENTIFYING DATA				
(*)Introdución á avaliación estructural de construcións patrimoniais				
Subject	(*)Introdución á avaliación estructural de construcións patrimoniais			
Code	O02M143V03217			
Study programme	Máster Universitario en Valoración, Gestión y Protección del Patrimonio Cultural			
Descriptors	ECTS Credits	Choose	Year	Quadmester
	3	Optional	1st	2nd
Teaching language	Spanish Galician			
Department				
Coordinator	Cabaleiro Núñez, Manuel			
Lecturers	Barros González, Brais Cabaleiro Núñez, Manuel Conde Carnero, Borja			
E-mail	mcabaleiro@uvigo.es			
Web	http://moovi.uvigo.gal/course/view.php?id=1080			
General description	This subject aims to train the student to understand the requirements in terms of structural safety of a building, taking into account the particularities of its heritage. Likewise, it will allow the student to conduct the tasks of documentation of the property through the technologies of geometric documentation and the materials addressed in module II of the master's degree, which serve as the basis for the diagnosis of the level of structural health of a heritage construction.			

Training and Learning Results	
Code	
A2	That students know how to apply the knowledge acquired and their ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their area of study.
B2	Acquire the necessary knowledge to handle the different tools of graphic, dimensional and geospatial documentation to be applied in the documentation and valuation of Cultural Heritage.
B3	Acquire the ability to bring to the practical application of the protection of cultural property the theoretical knowledge and the protocols of documentation, diagnosis and evaluation.
C2	Acquire the ability to design intervention protocols, establishing types, priorities and intensities of action before a cultural property at risk of alteration.
C9	Acquire the ability to diagnose, on the basis of scientific knowledge, the state of structural conservation of the Cultural Heritage.
C10	Understand the fundamentals of structural stability and the analysis procedures necessary to guarantee the structural safety of heritage constructions.
D5	Be able to predict and control the evolution of complex situations through the development of new and innovative work methodologies adapted to the specific scientific / research, technological or professional field, in general multidisciplinary, in which their activity is developed.
D8	Acquire advanced knowledge and demonstrate, in a context of scientific and technological research or highly specialized, a detailed and substantiated understanding of the theoretical and practical aspects and the methodology of work in one or more fields of study.

Expected results from this subject	
Expected results from this subject	Training and Learning Results

Acquisition of knowledge regarding structural security, analysis methods and regulations applicable to heritage buildings	A2 B2 B3 C2 C9 C10 D5 D8
Know the tools that allow a diagnosis of the structural condition of heritage buildings	A2 B2 B3 C2 C9 C10 D5 D8

Contents	
Topic	
Introduction to structural mechanics	Forces Moments Static equilibrium Thrust Structural stability.
Structural typologies, constructive elements and mechanical modeling	Wooden structures Masonry structures Metallic structures Concrete structures
Introduction to structural analysis methods.	Classic methods Theory of limit analysis in masonry structures Computacionais methods: finite method method, discrete element method.
Structural pathology in heritage buildings.	Main structural pathologies. Methodologies and techniques for identification and characterization.
Standards of mandatory compliance in terms of structural safety.	Código Técnico de la Edificación

Planning			
	Class hours	Hours outside the classroom	Total hours
Introductory activities	0.5	0	0.5
Seminars	4	15	19
Case studies	1.5	14	15.5
Problem solving	0	18	18
Essay	0	20	20
Systematic observation	0	1	1
Oral exam	1	0	1
*The information in the planning table is for guidance only and does not take into account the heterogeneity of the students.			

Methodologies	
	Description
Introductory activities	Activities directed to take contact and gather information on the students, as well as to present the module. They will present the module outline form of the matter, aims, calendar, criteria of evaluation, as well as forums of debate and news and other surroundings in which it will manage the learning.
Seminars	Activities focused to the work on each one of the technologies that present in the matter, so that the students can understand the theoretical principles of each technician to the time that take contact with the tools software that will allow them put in technical said practice during a process of documentation. These seminars will realise by means of videoconference and totorial videosl, on the studies of case of employment of each technician.

Case studies	Analysis of a problem or real case, with the purpose to know it, interpret it, resolve it, generate hypothesis, diagnose it and get introduced to alternative procedures of solution, to see the application of the theoretical concepts in the reality. They will employ as I complement of the theoretical classes for the autolearning.
Problem solving	Activities in which they formulate problems and/or exercises related with the matter.

Personalized assistance

Methodologies	Description
Case studies	Resolution of doubts and personalised attention of the work performed by the students. Resources used: platform for virtual teaching Moodle, and videoconference and e-meeting
Problem solving	Resolution of doubts and personalised attention through the videoconference and e-meeting.

Assessment

	Description	Qualification	Training and Learning Results
Essay	The student presents the result obtained in the elaboration of a document on the subject matter in the preparation of seminars, investigations, memories, essays, summaries of readings, conferences, etc. The learning outcomes are the student's training for the diagnosis of the structural condition of heritage assets, through the appropriate use of different identification tools and characterization of structural damage and pathologies, as well as using the applicable regulations.	40	A2 B2 C2 D5 B3 C9 D8 C10
Systematic observation	The performance of the student is being observed, as well as the practices and seminars through the telematic tools. The results of the learning are the qualification of the student for the structural diagnosis of the heritage.	20	A2 B2 C2 D5 B3 C9 D8 C10
Oral exam	The student will conduct a critical discussion on case study about characterization and diagnosis of a heritage construction. The student will argue their decisions regarding the most appropriate tools for identification and characterization of structural damage and pathologies, as well as the results obtained in said diagnosis.	40	A2 B2 C2 D5 B3 C9 D8 C10

Other comments on the Evaluation

According to the 2023 "*Regulation on the evaluation, qualification and quality of teaching and the student learning process of the University of Vigo*", there are two evaluation systems that students can choose: the preferred one, which will be applied by default, of "**continuous evaluation**" (diversified tests and activities that take place throughout the semester), and the so-called "**global evaluation**" (tests and/or delivery of work/exercises to be carried out on the official dates of evaluation established in the academic calendar), which must be expressly requested by the interested students, and communicated to the responsible teaching staff within a maximum period of 31 days from the beginning of each term.

The "**global evaluation**" tests for this subject will consist as follows: An essay of valuation of an heritage building (40%). An oral defense of the essay by the student (20%). An oral exam of short questions on the contents of the subject and the essay (40%).

Students have two evaluation calls/opportunities. The first is carried out during the teaching semester. The second (or 2nd opportunity) will take place in the month of July, for which access to the teaching platform will be enabled again.

Sources of information

Basic Bibliography

Complementary Bibliography

Heyman, Jackes, **The Stone skeleton : structural engineering of masonry architecture**, Cambridge University Press,

Zanni, Enrique, **Patología de la madera : degradación y rehabilitación de estructuras de madera**, Brujas,

Belén Riveiro, Mercedes Solla, **Non-Destructive Techniques for the Evaluation of Structures and Infrastructure**, CRC Press - Taylor and Francis,

Recommendations

Subjects that are recommended to be taken simultaneously

(*)Técnicas non destructivas para a avaliación do patrimonio cultural inmoble/O02M143V03218

Subjects that it is recommended to have taken before

2D and 3D Cartographic Documentation Techniques for Cultural Heritage/O02M143V03109

Other comments

The teaching of the subject will be always of face-to-face telematic way, well was synchronous or asynchronous, using the eMoodle (MooVi) educational platform and participating in the educational activities through multiple videoconference (e-meeting, Remote Campus).
To be able to receive the teaching of effective way it si recommended , previously to the start of the subject, to consult the manual of access to the platform and to follow the technical specifications in order to assist to the remote sessions. It is indispensable that each student access to the educational platform of the subject previously to the beginning of the same.
In general, for the practices will employ free software or free versions (demo) of commercial software for operating system Windows 7.