

1.1.1 Design and Retrofitting of Masonry Structures

GENERAL

SCHOOL	Engineering		
ACADEMIC UNIT	CIVIL ENGINEERING		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	ΔOM019	SEMESTER	7th
COURSE TITLE	Design and Retrofitting of Masonry Structures		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>	WEEKLY TEACHING HOURS	CREDITS	
	4	5	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Specialization Course		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)			

LEARNING OUTCOMES

<p>Learning outcomes <i>The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.</i></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> • <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> • <i>Guidelines for writing Learning Outcomes</i> 				
<p>Upon successful completion of the course, students will be able to:</p> <ol style="list-style-type: none"> 1. Know the properties of the individual materials (stone blocks and mortar) that make up the load-bearing masonry as well as the mechanical behavior of the composite material 2. Understand the structural system of load-bearing masonry structures and the element forces that develop in it 3. Apply the regulatory provisions of the current codes (Eurocodes 6 and 8) for the design of masonry structures 4. Recognize the typical forms of failure in structural elements and buildings from masonry and to propose/apply appropriate intervention techniques 				
<p>General Competences <i>Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?</i></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none;"><i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i></td> <td style="width: 50%; border: none;"><i>Project planning and management</i></td> </tr> <tr> <td style="border: none;"></td> <td style="border: none;"><i>Respect for difference and multiculturalism</i></td> </tr> </table>	<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i>	<i>Project planning and management</i>		<i>Respect for difference and multiculturalism</i>
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	<i>Respect for difference and multiculturalism</i>			

<i>Adapting to new situations</i> <i>Decision-making</i> <i>Working independently</i> <i>Team work</i> <i>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Production of new research ideas</i>	<i>Respect for the natural environment</i> <i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i> <i>Criticism and self-criticism</i> <i>Production of free, creative and inductive thinking</i> <i>Others...</i>
- Search for, analysis and synthesis of data and information, with the use of the necessary technology - Adapting to new situations - Decision-making - Working independently - Team work - Working in an interdisciplinary environment - Project planning and management - Criticism and self-criticism - Production of free, creative and inductive thinking	

SYLLABUS

<ul style="list-style-type: none"> • The individual materials of load-bearing masonry. Types of bricks and mortars • The mechanics of load-bearing masonry. Resistance to compression, tension, bending, and shear according to Eurocode 6 • Stress state at the ultimate limit state for gravity loads and seismic actions according to Eurocode 8 • Response of masonry structures to in-plane and out-of-plane loading • Pathology of masonry buildings. Typical forms of failure • Materials and intervention techniques (repairs-strengthening) in existing masonry constructions
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TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face to face.	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>		
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i> <i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i>	Activity	Semester workload
	Lectures	26
	Practice/exercises	26
	Project(s)	20
	Individual study	58
	Course total (26 hours workload per ECTS credit)	
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i> <i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i>	1. Assignment of tasks aimed at exploring the understanding of the concepts taught (30%). 2. Final written exam (in Greek) at the end of the semester (70%). 3. Each student is given the opportunity to review their written exam and have their mistakes analyzed.	

<i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	
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ATTACHED BIBLIOGRAPHY

- Karantoni F., Masonry Structures, Design and Repairs, Papatotiriou publ., 2012 (in Greek)
Spyrakos K., Assessment and Repairs for Seismic Loads, Ergonomos publ., 2019 (in Greek)
Tasios Th., Masonry Mechanics, Symmetry publ., 1992 (in Greek)
Tomaseciv M, Seismic Design of Masonry Buildings, Kleidarithmos publ., 2004 (in Greek)
Stylianidis K Ignatakis Ch. Masonry Structures (according to Eurocodes 6 8), AUTH publ., 2010 (in Greek)