

Course unit title:	Structures in Architecture IV		
Course unit code:	APX234		
Type of course unit:	Compulsory		
Level of course unit:	Diploma Degree of Architect - Engineer		
Year of study:	2		
Semester when the unit is delivered:	4 (Spring)		
Number of ECTS credits allocated :	3		
Name of lecturer(s):	Professor Dr. Milton Demosthenous		
Learning outcomes of the course unit:	<ol style="list-style-type: none"> <li>1. To be able to recognize the structural system of Reinforcement Concrete (R/C) structures. To understand that all the structural elements of R/C structures are consisted by concrete and steel, each material has different role for the static behavior and the one complete the other in order to give safety and stability to the structure.</li> <li>2. To realize that the structural system of such structures is constructed and completed in –situ and due to the possibility of bad construction, various codes and standards must be taking in the account during the design and especially during the construction of such structures.</li> <li>3. To know the physical and mechanical parameters of concrete and the materials we use for the production and maintenance in order to have high quality concrete.</li> <li>4. To know the physical and mechanical properties of steel and especially to understand the mechanical differences between steel and concrete, and also to know how we use it during the construction of structures.</li> <li>5. To understand the role of each structural element to support external loading (static and earthquake loading), how to transfer this loading to the foundation.</li> <li>6. To know the basic principles for earthquake resistance design of building R/C structures (simplicity, symmetry, bidirectional resistance and stiffness, torsional resistance and stiffness, diaphragmatic behaviour, adequate foundation). Especially to know the main role of shear wall to the stiffness of the structures and also to recognize the vulnerability of a structure and how to avoid it.</li> <li>7. To know the different types of foundations and when we use each of them and to be able to do simple calculations to estimate the dimensions of a footing.</li> <li>8. To be able to understand and decide about the correct position of placing the steel longitudinal bars and the stirrups and the role of longitudinal and transverse (stirrups) to the safety and stability of the structure. Also to be familiar and understand how is the detailing and the drawings of columns, beams, shear walls, plates and foundation, R/C structural elements.</li> <li>9. To be able to design the detailing drawings of the skeleton of R/C multi-storey building.</li> <li>10. To know the basic codes and standards for the design and construction of R/C structures.</li> </ol>		
Mode of delivery:	Face-to-face		
Prerequisites:	APX134	Co-requisites:	None
Recommended optional program components:	None		
Course contents:	This course focuses on the study of the structural behavior of		

	<p>reinforcement concrete structures. The main characteristics of concrete and steel bars as well the main principles for the design of the structural system of reinforcement concrete buildings is examined according to the existing codes of concrete structures and seismic design. In addition to that, the main principals of the details of reinforcing of structural members and frames as well the design of reinforcement details and the completion of technical report of structure are covered by this course.</p>
Recommended and/or required reading:	M. Demosthenous "Static of R/C structures" – Lecture Notes
Textbooks:	<ol style="list-style-type: none"> <li>1. G. Penelis "Concrete Structures", Vol. I, 1973</li> <li>2. C. Arnold &amp; R. Reitherman, "Building Configuration Seismic Design", 1982</li> <li>3. Chr. Ignatakis "Configuration and detailing of R/C structural elements", 2006</li> </ol>
References:	
Planned learning activities and teaching methods:	<p>The taught part of the course is delivered to the students by means of lectures and a number of numerical exercises. Lecture notes are available through the class for students to use in combination with the relevant textbooks and other notes.</p> <p>Lectures are supplemented with two project works (assignments) carried out on an individual basis. In the first project, the students have to do a research and write notes about the properties of the materials (concrete and steel), the basic codes and standards for the design and construction of R/C structures, the detailing of structural elements and basic principles for earthquake resistance design of R/c buildings. At the second project, the students have to design the skeleton of multi-storey building and give all the detailing drawings.</p>
Assessment methods and criteria:	<ul style="list-style-type: none"> <li>• Assignment 1                      10%</li> <li>• Assignment 2                      30%</li> <li>• Final Exam                          60%</li> </ul>
Language of instruction:	Greek English offered for Erasmus Students
Work placement(s):	