

Course unit title:	Structures in Architecture II		
Course unit code:	APX134		
Type of course unit:	Compulsory		
Level of course unit:	Diploma Degree of Architect - Engineer		
Year of study:	1		
Semester when the unit is delivered:	2 (Spring)		
Number of ECTS credits allocated :	5		
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 estimate the axial, the shear and the bending strength of a simple and complicate cross section of a beam and to understand the parameters related to that.</li> <li>2. To be able to estimate the critical buckling force for a column or a truss under compression axial force for various supporting conditions.</li> <li>3. To understand the role of the stiffness of a structural element and a whole structure and the parameters related to that. To understand the role of the various parameters (area, moment of inertia, length, modulus of elasticity, supporting conditions) to the stiffness of structural element and a structure to be able with various techniques to increase the stiffness of a structure</li> <li>4. To recognize and be able to design isostatic and hyperstatic structural system with beams and trusses.</li> <li>5. To be able to estimate the reaction forces at the supports of an isostatic structure.</li> <li>6. To understand and to be able to estimate the internal axial and shear forces and bending moments of an isostatic structural system consistent by beams and columns and design the corresponding diagrams [M], [N], [Q]. To be able to recognize the critical zones of the structural system through the previous diagrams.</li> <li>7. To understand and to be able to estimate the axial forces of trusses of an isostatic beam and recognize the critical zones under external loading.</li> <li>8. To understand the cases of failure of structural element through the correlation of the stressing with the corresponding strength.</li> </ol>		
Mode of delivery:	Face-to-face		
Prerequisites:	APX132	Co-requisites:	None
Recommended optional program components:	None		
Course contents:	<p>This course focus on the issues related to the synthesis and structural behavior of isostatic and hyrerstatic simple structural systems. The course includes numerical investigations on simple beams, one strory and multistory planar frame structures with beams elements and planar structural members (plates, shells, shear walls). This investigation focus on the estimation of the supporting reaction forces and the distribution of bending moments, axial forces and shear forces on the structural members and the stressing and deformation under various modes of loading. Through practical examples emphasis is given to the simulation of the structure or structural members and the evaluation of the numerical results due to the real structural problem.</p>		

Recommended and/or required reading:	M. Demosthenous "Static and Architecture II" – Lecture Notes
Textbooks:	<ol style="list-style-type: none"> <li>1. Beton Kalender 1984, Vol. 1</li> <li>2. Beton Kalender 1984, Vol. 2</li> <li>3. Beton Kalender 1984, Vol. 3</li> <li>4. Beton Kalender 1984, Vol. 4</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, students are requested to do a number of exercises in order to understand and to be familiar with the estimation of the strength and the stiffness of structural elements and a whole structure. At the second project, again thorough many calculations, the students have to be familiar and able to estimate the reaction forces at the supports of isostatic structures, to design the M, N, Q, diagrams and recognize the critical zones of structure from the stressing point of view.</p>
Assessment methods and criteria:	<ul style="list-style-type: none"> <li>• Assignment 1                      20%</li> <li>• Assignment 2                      20%</li> <li>• Final Exam                              60%</li> </ul>
Language of instruction:	Greek English offered for Erasmus Students
Work placement(s):	