

Course unit title:	Green Building Materials		
Course unit code:	CESU 410		
Type of course unit:	Elective		
Level of course unit:	Bachelor		
Year of study:	4		
Semester when the unit is delivered:	7 (Fall)		
Number of ECTS credits allocated :	6		
Name of lecturer(s):	Dr. Demetris Nicolaides		
Learning outcomes of the course unit:	<ol style="list-style-type: none"> 1. Ability to understand the concept of sustainability in relation to the building materials and capacity to apply sustainability in civil engineering practice. 2. Ability to understand the principles of Life Cycle Assessment and use the outcome of LCA for the selection of green construction materials. 3. Capacity to identify, explain and evaluate materials specification for the development of a greener structure. 4. Capacity to analyse and adopt rules for selection of greener materials. 5. Ability to understand and apply methods for the minimisation of the environmental impact of most common building materials and also identify potential applications. 		
Mode of delivery:	Face-to-face		
Prerequisites:		Co-requisites:	None
Recommended optional program components:			
Course contents:	<p>Overview of Civil Engineering materials: Revise of essential information related to Material properties, Material markets, Material flow, Embodied and process energies of materials, Impact on the Biosphere, Optimization of material use, Responsible sourcing.</p> <p>Concept of Sustainability: Explain the fundamental terminology related Sustainability, analyse the most important definitions and impacts and finally explain building materials Life-Cycle concerns.</p> <p>Sustainable Civil Engineering Design Practice: Analyse the existing policies on the role of the Engineer in Sustainability, present other guidelines for sustainable design and sustainability metrics for materials and explain what goes into our buildings.</p> <p>Life-Cycle Assessment (LCA) and Green Materials: Introduction to life-cycle assessment and explain the principles of selection of building materials using LCA.</p> <p>Material Specifications: Explain the components of a material specification, analyse the sustainability-based material specifications, highlight the required specifications for greener products and materials, and introduce the Product Transparency Movement</p> <p>Greener Products and Materials: Explain the rules for selection of greener materials, explain LEED Credits for materials and resources, highlight the importance of Durability and Performance of buildings, thermal and moisture protection, appropriate selection of house fixtures, indoor environmental quality and present issues of debate for discussion in class.</p> <p>Concrete, Masonry, Metals, Wood, Plastic, Composites: Explain how to minimise their environmental impact and present practices and processes of recycling and reusing and also potential applications.</p>		
Recommended and/or required reading:			
Textbooks:	"Green Building Materials: A Guide to Product Selection and Specification", Ross Spiegel		

	and Dru Meadows, Wiley Publishers, 2010.
References:	<p>“Civil Engineering Materials”, Jackon and Dhir, Palgrave Publishers, 1996.</p> <p>“Construction Materials: Their Nature and Behaviour”, edited by Illston and Domone, Spon Press; 1994.</p>
Planned learning activities and teaching methods:	<p>The course will be presented through theoretical lectures in class. The lectures will present to the student the course content and allow for questions. Part of the material will be presented using visual aids. The aim is to familiarize the student with the different and faster pace of presentation and also allow the instructor to present related material (photographs, videos, etc.) that would otherwise be very difficult to do. The learning process will be enhanced with the requirement from the student to solve relevant examples. These include self-evaluation exercises which will be solved in class. These exercises will not be graded. Exercises will also be given as homework which will be part of their assessment. Besides from the notes taken by students in class, all of the course material will be made available through the class website and also through MOODLE. Finally the instructor will be available to students during office hours or by appointment in order to provide any necessary tutoring.</p>
Assessment methods and criteria:	<ul style="list-style-type: none"> • Assignments 10% • Tests: 30% • Final Exam 60%
Language of instruction:	English
Work placement(s):	No