Course unit title:	Measurement and Costing of Engineering Services		
Course unit code:	CEC260		
Type of course unit:	Compulsory		
Level of course unit:	Bachelor (1st Cycle)		
Year of study:	2		
Semester when the unit is delivered:	4		
Number of ECTS credits allocated :	5		
Name of lecturer(s):	Mr. George Papadopoulos		
Learning outcomes of the course unit:	1. Identify methods of measurement and understand the general principles and standard methods of measurement 2. Apply measurement procedures and mensuration applications and skills for evaluating the advantages and disadvantages of different measurement methods 3. Measure elements of Engineering Services including Water Heating & Waste Installations, Electrical Installations, Drainage and External Works 4. Identify methods for the preparation and production of Bills of Quantities 5. Identify different estimating methods and tools and have the ability to estimate, analyse and evaluate construction costs		
Mode of delivery:	Face-to-face		
Prerequisites:		Co-requisites:	None
Recommended optional program components:			
Course contents:	**Methods of Measurement and Bills of Quantities Preparation:** Standard Methods of Measurement for Engineering Services. Definition of the Bill of Quantities. Presentation of the main types of Bills of Quantities, trade bills and elemental bills, and their advantages and disadvantages. Methods of Measurement or Taking Off. General principles for inserting dimensions and writing descriptions. Three main methods of preparing Bills of Quantities discussed: traditional method, cut and shuffle method and computer. **Measurement of Water, Heating & Waste Services:** Examples of measuring connection to mains, mains water supply/installation, sanitary appliances and accessories, heating and hot water Installations, waste systems, sundry items and making allowances for testing & commissioning of the installations **Measurement of Electrical Services:** Examples of measuring electrical circuits, switchgear and distribution boards, luminaires and accessories, sundry items and making allowances for testing & commissioning of the installations **Measurement of Drainage:** Examples of measuring and making allowances for testing & commissioning of the installations **Measurement of External Works:** Examples of measuring roads, drives, paths, grassed areas, trees, shrubs, hedges, fencing and gates **Bill of Quantities Preparation:** Examples of preparing the final Bills of Quantities for Engineering Services Works. **Estimating Construction Costs:** Definition of estimating and the use of the Code of Estimating Practice. Examples of estimating, analysing and evaluating Engineering Services costs using the methods available in the industry		

Recommended and/or required reading:	
Textbooks:	S. Lee, W. Trench & A. Willis, Willis's Elements of Quantity Surveying, 10th ed., Wiley Blackwell, 2005.
References:	• I.H. Seeley, Building quantities explained, 5th ed., Palgrave Macmillan, 1998. • P. Griffiths, S. Birchall & J.W. Ramus, Contract Practice for Surveyors, 4th ed., Butterworth-Heinemann, 2006. • M. Brook, Estimating and Tendering for Construction Work, 4th ed., Butterworth-Heinemann, 2008.
Planned learning activities and teaching methods:	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. Lecture notes, project assignments, practice questions, feedback and additional material such as site videos and photographs will be available to students at any time on the e-learning platform. The learning process will be enhanced with the requirement from the student to solve exercises. These include self-evaluation exercises which will be solved in class. Design projects will be given as part of their assessment. The instructor will be available to students during office hours or by appointment in order to provide any additional tutoring.
Assessment methods and criteria:	• Assignments 20% • Tests: 20% • Final Exam 60%
Language of instruction:	English
Work placement(s):	No