

Course unit title:	FORENSIC ENGINEERING		
Course unit code:	QSF300		
Type of course unit:	Elective		
Level of course unit:	Bachelor (1 <sup>st</sup> cycle)		
Year of study:	4		
Semester when the unit is delivered:	7 or 8		
Number of ECTS credits allocated :	6		
Name of lecturer(s):	Dr. Christakis Onisiphorou		
Learning outcomes of the course unit:	<ol style="list-style-type: none"> <li>1. Recognize the importance of forensic engineering and plan the site investigation.</li> <li>2. Investigate damage or collapse in a structure and determine the possible causes.</li> <li>3. Evaluate problems caused by settlement, expansive soils, slope failures and moisture intrusion.</li> <li>4. Investigate damage from earthquakes and other natural causes.</li> <li>5. Develop repair recommendations and prepare files and reports.</li> <li>6. Avoid civil liability and assess risk</li> </ol>		
Mode of delivery:	Face-to-face		
Prerequisites:	CE210	Co-requisites:	None
Recommended optional program components:			
Course contents:	<p><b>ASSIGNMENT AS FORENSIC ENGINEER AND INVESTIGATION</b>  Definition of a forensic engineer as an expert. Typical clients. Accepting the assignment. Planning of the site investigation. Technical documents involved.</p> <p><b>FORENSIC INVESTIGATIONS</b>  Excessive settlements of structures. Cracking damage. Expansive soils. Lateral movements. Slope failures and landslides. Earthquakes. Coastal erosion. Groundwater and moisture migration problems. Case studies.</p> <p><b>REPAIRS</b>  General recommendations for repairs. Foundation strengthening. Repair of concrete cracks. Rebuild and use of geogrids for slopes and embankments. Soil-cement repair. Examples from case studies.</p> <p><b>LIABILITY</b>  Ethical considerations and reducing potential liability. Report preparation and other legal issues. Risk assessment and professional insurance.</p>		
Recommended and/or required reading:			
Textbooks:	<ul style="list-style-type: none"> <li>• Day, R.W. (1999), <i>Forensic Geotechnical and Foundation Engineering</i>, McGraw Hill.</li> </ul>		
References:	<ul style="list-style-type: none"> <li>• Kardon, J.B. (2012), <i>Guidelines for Forensic Engineering Practice</i>, 2<sup>nd</sup> ed., ASCE.</li> <li>• Karper, K.L. (ed.) (1999), <i>Forensic engineering</i>, CRC Press.</li> <li>• Ratay, R.T. (2005), <i>Structural Condition Assessment</i>, Wiley.</li> </ul>		

Planned learning activities and teaching methods:	The course is delivered through lectures using powerpoint presentations and example case studies. The lectures will present to the student the course content and allow for questions. Relevant research papers are presented and discussed in class throughout the course. The learning process will be enhanced with the requirement from the student to carry in-class discussions, tackling of hypothetical scenarios and appropriate homework. Course assignments will also be undertaken for individual assessment. Besides from the notes taken by students in class, all of the course material will be made available through the class website available on the University e-learning platform. The instructor will be available to students during office hours or by appointment in order to provide necessary guidance.
Assessment methods and criteria:	<ul style="list-style-type: none"> <li>• Coursework                      50%</li> <li>• Final Exam                        50%</li> </ul>
Language of instruction:	English
Work placement(s):	No