Course unit title:	Bridge Engineering		
Course unit code:	CE 435		
Type of course unit:	Elective		
Level of course unit:	Bachelor (1st Cycle)		
Year of study:	4		
Semester when the unit is delivered:	8 (Spring)		
Number of ECTS credits allocated :	6		
Name of lecturer(s):	Dr. Petros Christou		
Learning outcomes of the course unit:	1. Ability to integrate topics from various civil engineering disciplines in the design of bridges. 2. Capacity to understand the effects of dynamic loads including earthquakes on bridges. 3. Ability to implement structural dynamics in the analysis and design of bridges and their components. 4. Appreciation of the use and effects of modern mechanical devices on the dynamic behaviour of bridges. 5. Appreciation of the current state of the art methods of bridge construction. 6. Develop critical thinking skills necessary to handle open-ended design problems, including analyzing and assessing multiple bridge alternatives.		
Mode of delivery:	Face-to-face		
Prerequisites:	CE 300,CE 310	Co-requisites:	
Recommended optional program components:			
Course contents:	**Introduction:** • Types of Modern Bridges in Highway Construction • Geotechnical Considerations • Inception and conceptual aspects of Bridge Engineering **Highway Loading** • Highway Loading to BS5400 and EC1 **Analysis of Bridges** • Review of Influence Lines and the placement of Loads for maximum effects • Soil-Structure Interaction and the modelling of soil and pile foundations • Modelling of bearings. **Design Considerations to EC2 and EC8 for bridges** • General Arrangement • Earthquake Design and articulation systems. • Component design • Various design important issues		
Recommended and/or required reading:			
Textbooks:	C.R. Hendy and D.A. Smith, **"Designers' Guide to EN 1992 Eurocode 2: Design of concrete structures. Part 2: concrete bridges"**, Thomas Telford Ltd, 2007.		

References:	• M. J. N. Priestley, F. Seible, and G. M. Calvi, **"Seismic Design and Retrofit of Bridges (Hardcover)"**, Wiley-Interscience, 1996. • W. H. Mosley, **"Reinforced Concrete Design to Eurocode 2"**, MacMillan Pub Ltd, 1996 • Journal Articles and Case Studies • Codes BS5400 EC1 and EC2 and EC8
Planned learning activities and teaching methods:	The course will be presented through lectures in class. The aim of the lectures is to provide the student with the thinking process of the instructor and allow for questions related to issues that may come up during the presentation. Part of the material will be presented using visual aids (normally in Power Point presentations). 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 etc) that would otherwise be very difficult to do. 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 by the students in the presence of the instructor. This will give the students the opportunity to solve problems and if they have difficulties then discuss with the instructor. The exercises will not be graded rather they will provide the student a way to evaluate their ability to solve problems. Exercises will also be given to the students to solve as homework assignment. Those will be part of their assessment. Part of the teaching process will be the availability of the course material to the students. In addition to the class notes which the students will take during normal lectures, the instructor will make available all the class notes, presentations and other relevant material. This will be possible through the class website which is developed and also the use of MOODLE. Finally the instructor will be available to students during office hours or by appointment in order to provide any necessary tutoring.
Assessment methods and criteria:	• Course Work: 50% • Final Exam: 50%
Language of instruction:	English
Work placement(s):	No