

Course unit title:	Transportation Engineering for Sustainability		
Course unit code:	CETSU314		
Type of course unit:	Compulsory		
Level of course unit:	Bachelor (1st Cycle)		
Year of study:	3		
Semester when the unit is delivered:	6 (Spring)		
Number of ECTS credits allocated :	6		
Name of lecturer(s):	Dr. George Michaelides		
Learning outcomes of the course unit:	<ol style="list-style-type: none"> 1. Understand general concepts related to transport engineering 2. Describe factors affecting the selection of location and layout of an airport. 3. Describe categories of terminal buildings of airports and factors affecting the decision making 4. Identify categories of road transport data and their importance for road planning, maintenance and management 5. Solve problems of speed surveys and evaluate results 6. Solve forecasting model (trip generation, trip distribution, mode choice and trip assignment) problems using different algorithms. 7. Describe road network, classes of road and junctions 8. Perform traffic signal design and evaluate results 		
Mode of delivery:	Face-to-face		
Prerequisites:	None	Co-requisites:	None
Recommended optional program components:			
Course contents:	<p>Introduction: Description of general concepts related to transport engineering</p> <p>Transport in society: Present the need of transport and also why public transport is needed. Explain modal split and several transport engineering concepts.</p> <p>Physical components of transport: Infrastructure; terminal; of carriage and motive power. Characteristics of a transport system. Overview of major transportation systems.</p> <p>Air Transport: Characteristics of air transport. Operational, meteorological, physical, environmental and economic factors affecting the selection of location and layout of an airport. Basic requirements for technical buildings. Factors affecting location, length and direction of runways. Parking, Importance of accessibility and connection with other means of transport. Describe different types of airports: centralized and decentralized</p> <p>Data Collection: Different categories of road transport data for the planning, design and management of transport systems. Categories of data include: journey characteristics, traffic characteristics, parking studies, accidents studies. Methods for data collection for each category. Solution of home interview problems. Solution of problems of speed surveys and evaluation of results</p> <p>Road Transport: Use of the forecasting model and solution of problems using: trip generation, trip distribution, mode choice, trip assignment methods using different algorithms. Factors affecting: (a) trip generation (income, household size), (b) trip distribution (distance between zones, socioeconomic factor), (c) mode choice (cost, time) and (d) trip assignment (traffic, distance, time, signals, type of road). Description of road network and classes of road with characteristics for each class. Types of junctions and advantages/disadvantages for each one. Different types of pavement.</p> <p>Traffic Signals: Definitions related to traffic signals (red time, phase, intergreen period, change interval, all red, cycle length, etc). Suitability of junctions for traffic signal. Solution of problems related to traffic signal design and evaluation of results.</p>		
Recommended and/or required			

reading:	
Textbooks:	"Handbook of Transportation Engineering" Myer Kutz, McGraw-Hill Professional, 2003.
References:	"Transportation Engineering and Planning" C. S. Papacostas and P.D. Prevedouros, 3 rd Edition Prentice Hall, 2000. " Introduction to Transportation Engineering" James H. Banks, McGraw Hill Higher Education, 2001 "Traffic Engineering" Roger P. Roess, Elena S. Prassas and William R. McShane, 3 rd Edition, 2004.
Planned learning activities and teaching methods:	The course will be presented through formal theoretical lectures, practical problems and tutorial sessions in class. The lectures will present to the student the course content and allow time for questions and discussion. Numerical examples are solved in class and tutorial questions are provided for private study. Practical exercises in lecture periods are submitted as assignments by the student and are completed with reduced angle calculations and plan drawings. Notes shall be taken by the students in class during lectures. In addition, all of the course material will be made available through the class website and also through the university's own e-learning platform. 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:	<ul style="list-style-type: none"> • Assignments 20% • Tests: 20% • Final Exam 60%
Language of instruction:	English
Work placement(s):	No