Course unit title:	Water and Wastewater Engineering		
Course unit code:	CE335		
Type of course unit:	Compulsory		
Level of course unit:	Bachelor (1st Cycle)		
Year of study:	3		
Semester when the unit is delivered:	6		
Number of ECTS credits allocated :	6		
Name of lecturer(s):	Dr. Christos Anastasiou		
Learning outcomes of the course unit:	1. Define basic terms and concepts relating to potable water and wastewater engineering. 2. Differentiate among various wastewater streams based on their characteristics 3. Recognize key terms and concepts relating to water supply and potable water treatment, as well as wastewater production and treatment 4. Measure key wastewater characteristics (BOD, COD, TS, TN, TP) 5. Identify key unit processes (coagulation / flocculation, sedimentation, filtration, and disinfection) involved in the treatment of potable water and key unit processes (aeration, sedimentation, filtration, and disinfection) involved in the treatment of wastewater. 6. Formulate possible solutions to various potable water and wastewater treatment scenarios. 7. Associate different treatment methods with analogous wastewater streams 8. Design the main components (unit processes) of an Activated Sludge wastewater treatment plant		
Mode of delivery:	Face-to-face		
Prerequisites:	CE230	Co-requisites:	None
Recommended optional program components:	None		
Course contents:	**Introduction (Water, Wastewater principles, terms, and concepts):** Basic terms and concepts relating to potable water and wastewater engineering. Important issues that relate to potable water and various types of wastewater. Various wastewater streams and their characteristics. The root causes of water supply issues that we are facing in Cyprus. Discussion of possible scenarios of public health manifestations of environmental pollution sources and events. **Potable Water Supply and Treatment:** Key terms and concepts relating to water supply and potable water treatment. Identify key unit processes (coagulation / flocculation, sedimentation, filtration, and disinfection) involved in the treatment of potable water. Various potable water treatment designs and scenarios. Design of the main components of a potable water treatment plant. Calculation of the basic operational parameters and chemical doses used in a potable water treatment plant **Wastewater Treatment:** Key terms and concepts relating to wastewater production and treatment. Estimate wastewater quantity production from municipal and industrial sources. Key wastewater characteristics (BOD, COD, TS, TN, TP). Different treatment methods with analogous wastewater streams / sources (Aerobic, Anaerobic, Continuous flow, Sequencing Batch Reactors, Constructed Wetlands). Introduction to the key unit processes in an Activated Sludge Plant (aeration, sedimentation, filtration, and disinfection). Design parameters of the main components (unit processes) of an Activated Sludge wastewater treatment plant. Calculation of the basic operational parameters (i.e. HRT, SRT, Recycling Rates, Sludge Production rates, aeration time) and chemical (i.e. chlorine) doses used in		

	an activated sludge wastewater treatment plant
Recommended and/or required reading:	
Textbooks:	• Tchobanoglous, G., F.L. Burton, and H.D. Stensel. 2002. *Wastewater Engineering: Treatment and Reuse* - 4th Edition, McGraw-Hill, USA, ISBN 978-0070418783 • MWH. 2005. Water Treatment: Principles and Design – 2nd Edition, Wiley, USA, ISBN 978-0471110187
References:	• American Water Works Association and American Society of Civil Engineers. 1997. *Water Treatment Plant Design* – 3rd Edition, McGraw-Hill Professional, USA, ISBN 978-0070016439 • Journal Papers • World Wide Web Sites (i.e. EU Environmental Commission, USEPA, USDA.)
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. The material will be presented using visual aids (i.e. PowerPoint presentation slides, documentaries, etc.). The aim is to familiarize the student with the different and faster pace of presentation and also allow the instructor to present related material that would otherwise be very difficult to do. The learning process will be enhanced with the requirement from the student to carry in-class discussions and tackling of hypothetical scenarios in small-group exercises. In-class problem-solving as well as homework exercises (mostly numerical) will allow students to practice their design skills in a controlled setting. A final project, which will be required as part of the students assessment for the course, will allow students the opportunity to carry out independent research, synthesize basic concepts presented in class, as well as hone their writing and presentation skills. Besides from the notes taken by students in class, all of the course material will be made available through the class website which will be available through the University's E-learning platform. The instructor will be available to students during office hours or by appointment in order to provide necessary guidance. The course will involve a laboratory component. In the laboratory, students are expected to carry out basic measurements of water and wastewater parameters introduced in class (i.e. BOD, COD, TS, TN, TP, Chlorine residual, and Turbidity).
Assessment methods and criteria:	• Assignments 10% • Lab Reports 10% • Tests: 30% • Final Exam 50%
Language of instruction:	English
Work placement(s):	No