

a) General			
<i>School</i>	ENGINEERING		
<i>Academic unit</i>	MECHANICAL ENGINEERING		
<i>Level of studies</i>	Undergraduate		
<i>Course code</i>	MM107E01	<i>Semester</i>	7
<i>Course title</i>	<b>Environmental engineering</b>		
<i>Independent teaching activities</i>	<i>Weekly teaching hours</i>		<i>ECTS</i>
Lectures	2		4.0
Laboratory exercises	2		
<i>Course type</i>	Knowledge deepening/consolidation		
<i>Course category</i>	Compulsory Elective for Direction 1		
<i>Prerequisite courses</i>	-		
<i>Language of instruction and examinations</i>	Greek / English		
<i>Is the course offered to Erasmus students</i>	Yes		
<i>Course website (url)</i>	<a href="https://ops.mech.uniwa.gr/">https://ops.mech.uniwa.gr/</a>		
b) Learning outcomes and general competences			
b1. Learning outcomes			
<p>Upon successful completion of this course, the student will be able to:</p> <ul style="list-style-type: none"> <li>- Acquire an integrated knowledge for the waste sources (liquid and solid) and their impacts in the natural resources</li> <li>- Familiarise with the waste impacts mitigation measures and, more specifically with the waste treatment and waste management technologies</li> <li>- Get a better understanding of contemporary water supply resources and methods and the respective plants</li> <li>- Study in detail the operation and technological advancements of desalination plants</li> <li>- Acquire knowledge and, as much as possible, practical experience in the construction and operation of waste and water treatment processes and plants</li> <li>- Get to know the professional prospects emerging from their involvement with the environmental engineering aspects</li> </ul>			
b2. General competences			
<ul style="list-style-type: none"> <li>- Search for, analysis and synthesis of data and information with the use of the necessary technology</li> <li>- Decision-making</li> <li>- Working independently</li> <li>- Team work</li> <li>- Working in an interdisciplinary environment</li> <li>- Respect for the natural environment</li> </ul>			
c) Syllabus			
<p>The aim of the course is to provide the state of the art in legislation, practices and technological developments in environmental engineering and respective systems. For this purpose, the key areas of environmental engineering namely water supply resources, plants and infrastructures solid and liquid waste streams and mitigation technologies are in detail analysed in the course context. More precisely the type of water resources, the respective infrastructures, and the role of technological advancements in desalination plants are analysed in the framework of water resources management. In the liquid waste section, water pollution resources, key differences</p>			

between municipal and industrial wastewater as well as the stages and the treatment principles of waste-water treatment plants are studied. In the solid waste section, the principles/steps applying to integrated waste management, from the prevention of the production to recycling, energy recovery and finally end disposal are analysed via also special case studies.

**d) Teaching and learning methods - Evaluation**

Delivery	Face-to-face, Workshops, Lab Exercises	
Use of information and communications technology	- MS Teams/Moodle - Open courses	
Teaching methods	<i>Activity</i>	<i>Semester workload</i>
	Lectures	26
	Tutorials	
	Laboratory exercises	26
	Computational exercises	13
	Individual work	13
	Course total	130
Student performance evaluation	Written examinations, assignments, software applications	

**e) Suggested bibliography**

1. Kaldellis K., Ioannis and Kondili M. Emilia, 2005 "ENVIRONMENT AND INDUSTRIAL DEVELOPMENT - Volume B'- [ΠΕΡΙΒΑΛΛΟΝ ΚΑΙ ΒΙΟΜΗΧΑΝΙΚΗ ΑΝΑΠΤΥΞΗ- Τόμος Β] " ISBN: 9603516015, Ed. Stamoulis, Greece
2. Metcalf & Eddy, 2006, "WASTEWATER ENGINEERING TREATMENT AND REUSE- Volume A', [ΜΗΧΑΝΙΚΗ ΥΓΡΩΝ ΑΠΟΒΛΗΤΩΝ, ΤΟΜΟΣ Α']", ISBN: 9789604181094, Ed. Tziola, Greece
3. Mackenzie Davis and Masten Susan, 2019, "PRINCIPLES OF ENVIRONMENTAL ENGINEERING & SCIENCE", 4<sup>th</sup> Edition, ISBN: 1260548023, Ed. McGraw-Hill, Europe
4. Lymperatos Gerassimos and Vagenas Dimitris, 2011, "LIQUID WASTE MANAGEMENT [ΔΙΑΧΕΙΡΙΣΗ ΥΓΡΩΝ ΑΠΟΒΛΗΤΩΝ]", ISBN: 9789604183463, Ed. Tziola, Greece
5. Tchobanoglou G., Kreith Frank, 2010, " HANDBOOK OF SOLID WASTE MANAGEMENT [ΕΓΧΕΙΡΙΔΙΟ ΔΙΑΧΕΙΡΙΣΗΣ ΣΤΕΡΕΩΝ ΑΠΟΒΛΗΤΩΝ] ", ISBN: 960418247, Ed. Tziola, Greece