



COURSE OUTLINE

1. GENERAL					
SCHOOL	FACULTY OF ENGINEERING				
DEPARTMENT	ENVIRONMENTAL ENGINEERING				
LEVEL OF STUDIES	UNDERGRADUATE				
COURSE CODE	15HY5N-K1 SEMESTER 9°				
COURSE TITLE	CLIMATE CHANGE: THE SCIENTIFIC EVIDENCE / MITIGATION				
	ACTIONS OF EXTREME CLIMATE PHENOMENA				
TEACHING ACTIVITIES					
If the ECTS Credits are distributed in distinct parts of the course e.g.			TEACHING		
lectures, labs etc. If the ECTS Credits are awarded to the whole			HOURS PER	ECTS CREDITS	
course, then please indicate the teaching hours per week and the		WEEK			
Corresponding ECTS Credits.		3	5		
			5		
Please, add lines if necessary. Teaching methods and organization of					
the course are described in section 4.					
COURSE TYPE	SCIENTIFIC AREA				
Background, General Knowledge, Scientific					
Area, Skill Development					
PREREQUISITES:	MATHEMATICS, ATMOSPHERIC CHEMISTRY, ATMOSPHERIC				
	POLLUTION				
TEACHING & EXAMINATION					
LANGUAGE:	ENGLISH FOR ERASMUS STUDENTS				
COURSE OFFERED TO ERASMUS	YES				
STUDENTS:					
COURSE URL:	https://eclass.duth.gr/courses/TMC356/				

2. LEARNING OUTCOMES

Learning Outcomes Please describe the learning outcomes of the course: Knowle the course.	dge, skills and abilities acquired after the successful completion of
The goal of this course is the familiarization climate change. After the completion of the	of the students with the science that explains course the students will be able to:
 understand the factors that trip evaluate and understand the end Earth's climate understand the function and the prediction predict the effects of climate comphenomena, nature and huma suggest solutions and mitigation 	gger the climate change ffect of the greenhouse gases and the aerosol on ne use of climate models for the climate change hange on the frequency of extreme climate n on actions of extreme climate phenomena
General Skills Name the desirable general skills upon successful con	apletion of the module
Search, analysis and synthesis of data and information, ICT Use Adaptation to new situations Decision making Autonomous work Teamwork Working in an international environment Working in an interdisciplinary environment Production of new research ideas	Project design and management Equity and Inclusion Respect for the natural environment Sustainability Demonstration of social, professional and moral responsibility and sensitivity to gender issues Critical thinking Promoting free, creative and inductive reasoning
Adaptation to new situations	







Search, analysis and synthesis of data and information, ICT Use Decision making Autonomous work Respect for the natural environment

3. COURSE CONTENT

1. Atmosphere: composition of atmosphere, layers of the atmosphere, general circulation of winds, heat transport

- 2. Electromagnetic radiation, solar radiation, earth radiation, heat balance in the atmosphere
- 3. Study of past climates
- 4. Natural cause of climate change
- 5. Anthropogenic intervention in the climate: greenhouse gases
- 6. Anthropogenic intervention in the climate: atmospheric particles, CCN
- 7. Models predictions of climate change
- 8. Extreme climate phenomena
- 9. Consequences of climate change on nature, animals, human and the quality of life

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face		
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT)	Use of ICT in teaching and laboratory education, usage of board		
Use of ICT in Teaching, in Laboratory Education, in Communication with students			
TEACHING ORGANIZATION	Activity	Workload/semester	
The ways and methods of teaching are described in detail	Lectures	50	
Lectures, Seminars, Laboratory Exercise, Field	Exercises/problems	10	
Exercise, Bibliographic research & analysis,	Individual/teamwork	65	
Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning,	project creation		
Study visits, Study / creation, project, creation,	Project presentation	25	
project. Etc.			
The supervised and unsupervised workload per	Total	150	
activity is indicated here, so that total workload			
Description of the evaluation process			
Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about	Formative Written exam, individual or teamwork semester project with presentation and oral theory questions		
Please indicate all relevant information about the course assessment and how students are informed			

5. SUGGESTED BIBLIOGRAPHY

1. «Κλιματική αλλαγή», Πασχαλίδου Αναστασία, ΤΖΙΟΛΑ, 2021.

- 2. «Κλιματολογία και κλιματική αλλαγή», Barry Roger G." "Hall-McKim Eileen A, TZIOΛA, 2022.
- 3. «ATMOSPHERIC CHEMISTRY AND PHYSISCS», J. Seinfeld, S. N. Pandis. Wiley Interscience, Second Edition 2006 (Στην βιβλιοθήκη του ΔΠΘ με αριθμό καταχώρησης QC 879.6.S45 2006).







ANNEX OF THE COURSE OUTLINE

Alternative ways of examining a course in emergency situations

Teacher (full name):	Evangelia Kostenidou
Contact details:	ekosteni@env.duth.gr
Supervisors: (1)	YES
Evaluation methods: (2)	Oral examination with distance learning methods
Implementation Instructions: (3)	The exams will take place in zoom. All the students will be connected through their university account, otherwise they will not have access. Each student will present his/her project and then he/she will answer oral questions raised by the professor. The duration of each presentation will be 20 min. During the examination the webcam will be on. At the beginning of the examination each student will show their ID on the webcam for the verification of his/her identification.

(1) Please write YES or NO

(2) Note down the evaluation methods used by the teacher, e.g.

written assignment or/and exercises

- written or oral examination with distance learning methods, provided that the integrity and reliability of the examination are ensured.
- (3) In the Implementation Instructions section, the teacher notes down clear instructions to the students:

a) in case of written assignment and / or exercises: the deadline (e.g. the last week of the semester), the means of submission, the grading system, the grade percentage of the assignment in the final grade and any other necessary information.

b) in case of **oral examination with distance learning methods:** the instructions for conducting the examination (e.g. in groups of X people), the way of administration of the questions to be answered, the distance learning platforms to be used, the technical means for the implementation of the examination (microphone, camera, word processor, internet connection, communication platform), the hyperlinks for the examination, the duration of the exam, the grading system, the percentage of the oral exam in the final grade, the ways in which the inviolability and reliability of the exam are ensured and any other necessary information.

c) in case of **written examination with distance learning methods**: the way of administration of the questions to be answered, the way of submitting the answers, the duration of the exam, the grading system, the percentage of the written exam of the exam in the final grade, the ways in which the integrity and reliability of the exam are ensured and any other necessary information.

There should be an attached list with the Student Registration Numbers only of students eligible to participate in the examination.

