COURSE OUTLINE HYDROMETEREOLOGICAL DISASTERS PREDICTION AND MANAGEMENT

1. GENERAL

SCHOOL	SCHOOL OF ENGINEERING		
DEPARTMENT	PREVENTION AND MANAGEMENT OF CRISIS AND DISASTERS: INNOVATIVE TECHNIQUES IN CIVIL PROTECTION		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	CP10.3	**SEMESTER**	8th Semester
COURSE TITLE	Geotechnical hazards: understanding – hazard assessment – prevention and protection measures		

TEACHING ACTIVITIES *If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.*	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
	3.0	6.0
Please, add lines if necessary. Teaching methods and organization of the course are described in section 4.		

COURSE TYPE *Background, General Knowledge, Scientific Area, Skill Development*	Scientific Area
PREREQUISITES:	NO
TEACHING & EXAMINATION LANGUAGE:	Greek, English
COURSE OFFERED TO ERASMUS STUDENTS:	YES
COURSE URL:	https://eclass.duth.gr/courses/

2. LEARNING OUTCOMES

Learning Outcomes

Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

At the end of the course the student will be able to:

- *Understand the key issues of flood management as well as the processes that govern the generation and propagation of floods.*
- *Address the dynamics of flood risk in a changing climate*
- *Develop comprehensive flood risk management strategies in a changing climate*
- *Implement structural and non-structural measures to reduce flood risks*
- *Develop preparedness and response plans to effectively reduce flood risk*
- *Integrate flood restoration programs into flood risk management strategies*
- *Address emergency flood risk management issues.*
- *Know the impact that climate change will have on the human, natural and built environment, covering key aspects such as water resources, flooding, sea level rise and coasts, health, transport, infrastructure and cities.*

- *Be able to evaluate, propose and implement sustainable adaptation strategies to basic infrastructure and environmental regulations.*

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,	*Project design and management*
ICT Use	*Equity and Inclusion*
Adaptation to new situations	*Respect for the natural environment*
Decision making	*Sustainability*
Autonomous work	*Demonstration of social, professional and moral responsibility and sensitivity to gender issues*
Teamwork	*Critical thinking*
Working in an international environment	*Promoting free, creative and inductive reasoning*
Working in an interdisciplinary environment	
Production of new research ideas	

Adaptation to new situations
Decision making
Working in an interdisciplinary environment
Project design and management
Respect for the natural environment
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

1. Introduction to floods, their categories and mechanisms.
2. Analysis of flood hydrological processes (estimation of rainfall losses and the rainfall-runoff mechanism).
3. Hydrological flood channeling.
4. Hydraulic flood simulation with open source software.
5. Analysis and evaluation of technical flood control projects.
6. Analysis of natural flood management solutions.
7. Introduction to the concept of drought
8. Types of drought - Drought Indicators
9. Dynamic evapotranspiration, plant coefficient, effective precipitation, crop water needs.
10. Drought assessment models - water balance
11. Drought and Water Resources Management
12. Climate change and drought
13. Industrial and technical projects to address drought

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, in*	Use of ICT in Teaching Use of ICT in Communication with students

Laboratory Education, in Communication with students	
TEACHING ORGANIZATION *The ways and methods of teaching are described in detail.* *Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research & analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.* *The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards.*	
STUDENT EVALUATION *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 the course assessment and how students are informed*	Student evaluation languages Greek English Method (Formative or Concluding) Summative Student evaluation methods Written Exam with Problem Solving 50% Mid term exams 50%

Activity	*Workload/semester*
Lectures	39
Essay	60
Study	78
Examinations	3
Total	**180**

5. SUGGESTED BIBLIOGRAPHY

1. Τσακίρης Γ. (Υπεύθυνος Έκδοσης), (1995). «ΥΔΑΤΙΚΟΙ ΠΟΡΟΙ: Ι. Τεχνική Υδρολογία», Εκδόσεις Συμμετρία, Αθήνα, ISBN 960-266-003-1.
2. Σακκάς Ι.Γ. (2004). «ΤΕΧΝΙΚΗ ΥΔΡΟΛΟΓΙΑ, Τόμος 1, Υδρολογία Επιφανειακών Υδάτων», Εκδόσεις Αϊβάζη, Θεσσαλονίκη.
3. Spiliotis M., Iglesias A. and Garrote L., 2020. A multicriteria fuzzy pattern recognition approach for assessing the vulnerability to drought: Mediterranean region. Evolving Systems (in print, https://doi.org/10.1007/s12530-020-09332-7
4. Τσακίρης Γ. (2006). Υδραυλικά έργα: Σχεδιασμός και διαχείριση, Εγγειοβελτιωτικά έργα. Εκδόσεις Συμμετρία.