COURSE OUTLINE

1. GENERAL

SCHOOL	School of Engineering
DEPARTMENT	Department of Civil Engineering/ Master Program 'Hydrometeorological Disasters Program
LEVEL OF STUDIES	7
COURSE CODE	ΥΚΣΥΑΓΤΚΠΣΑΠ		**SEMESTER**	1st
COURSE TITLE	Hydroinformatics and Decision Support Systems (DSS) for flood risk in urban areas

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
Lectures	3	6
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:	NO
COURSE URL:	https://eclass.duth.gr/courses/1021376/

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.

Once the course is completed, participants will be able to:

- Understand the potential of available data sources (weather satellites, web resources, data produced by climate and meteorological models) in advanced integrated models and decision support.
- Generate the primary input data of the models using Geographic Information Systems and remote sensing techniques.
- To shape and solve water resource problems as optimization problems.
- Create and optimize water resource models that will act as decision support systems.
- Separate and correctly use different types of decision support methods for water problems.
- Evaluate and optimize existing models
- Create and propose decision-making tools related to water problems.

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	
Working in an international environment	*Critical thinking*
Working in an interdisciplinary environment	*Promoting free, creative and inductive reasoning*
Production of new research ideas	

- Search, analysis and synthesis of data and information
- Production of new research ideas
- Project design and management
- Respect for the natural environment
- Promoting free, creative and inductive reasoning

3. COURSE CONTENT

1. Introductory concepts of hydroinformatics and optimization of water resources systems.
2. Analysis and processing of satellite data
3. Geographic Information Systems, Group Decision Support Systems, Database and Model Management Systems.
4. Spatial Multi-Criteria Data Analysis using Geographic Information Systems
5. Introduction to Decision Support Systems
6. Introduction to systems analysis.
7. Knowledge mining
8. Analysis of the simulation-optimization combination
9. Analysis of multicriteria optimization
10. Uncertainty Analysis - Monte Carlo Simulation
11. Modeling and simulation of water resource systems.
12. Optimizing resource models

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD *Face to face, Distance learning, etc.*	Distance learning
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) *Use of ICT in Teaching, in Laboratory Education, in Communication with students*	Use of ICT in Teaching, and Communication with students • Digital slides • videos • MsTeams/ e-class, webmail

TEACHING ORGANIZATION	Activity	Workload/semester
The ways and methods of teaching are described in detail.	Lectures	39
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.	Final project	60
	Bibliographic research & analysis	78
	Final examination	3
The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards.		
	TOTAL	**180**

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,*	Written Assignment, 100%

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*	

5. SUGGESTED BIBLIOGRAPHY

ANNEX OF THE COURSE OUTLINE

Alternative ways of examining a course in emergency situations

Teacher (full name):	Maris F., Spiliotis M., Papaioannou G., Iliadis L., Papaleonidas A.
Contact details:	fmaris@civil.duth.gr, mspiliot@civil.duth.gr, gpapaio@fmenr.duth.gr, liliadis@civil.duth.gr, papaleon@civil.duth.gr,
Supervisors: (1)	YES
Evaluation methods: (2)	Written Assignment (100%)
Implementation Instructions: (3)	Written assignment should be submitted via eclass on a specified date.