swarm

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Innovation of existing and development of new master curricula for WRM in WB

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Workshop on
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United Nations Educational Scientific and Cultural Organization

uniTwin

UNESCO Chair International Network of Water-Environment Centres for the Balkans

Aristotle University of Thessaloniki

Synopsis of proposed courses by WB Universities

	Undegraduate		Master	
University	New courses	Upgrate/improve of existing courses	New courses	Upgrate/improve of existing courses
University of Pristina in Kosovska Mitrovica/ Faculty of Technical Sciences		1 (1 course to be divided in 2 courses)	3	
Technical College of Applied Sciences Urosevac-Leposavic			5	
University of Montenegro/Faculty of Civil Engineering	Only Introduction of laboratory exercises and experiments			
University of Novi Sad/Faculty of Technical Sciences			6	
University of Mostar/Faculty of Civil Engineering			3	2
University of Nis /Faculty of Civil Engineering and Architecture	4		2	
University of Sarajevo/Faculty of Civil Engineering			1	6
TOTAL	4	1	19	8

Proposed template of courses' description

Course Unit Title:		
Course Unit Code:		
Type of Course Unit: **(Compulsory/Optional)**		
Level of Course Unit: **(first, second or third cycle)**		
Number of ECTS credits allocated:		
Name of lecturer(s):		
Learning Outcomes of the course unit:		
Upon completion of the course, participants should be able to demonstrate:		
Mode of Delivery:		
Prerequisites and co-requisites:		
Recommended optional program components:		
Course Contents: **Objective:** **Description:**		
Recommended **or** **required reading:**		
Planned learning activities and teaching methods	Class Instruction Consultation	
Assessment methods and criteria:	Examinations Assignment(s)	80% 20% 100%
Language of Instruction:		
Work Placement(s):		
Place of Teaching:		

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Thematic area: Application of cutting-edge computer technologies in control /supervisory activities in the water sector

Course Unit Title:	**Geographical Information Systems (GIS) and water resources management**
Course Unit Code:	
Type of Course Unit: (Compulsory/Optional)	**Elective**
Level of Course Unit: (first, second or third cycle)	
Number of ECTS credits allocated:	**5**
Name of lecturer(s):	**Dr. Ch. Skoulikaris**

Learning Outcomes of the course unit:

Upon completion of the course, participants should be able to demonstrate:

- **Ability to identify, describe, and convert between common geospatial data types in a GIS;**
- **Ability to explain, transform and manipulate map projections and coordinate systems;**
- **Ability to identify, describe and perform various kinds of basic spatial analyses;**
- **Understanding of raster analysis**
- **Ability to accurately digitize riverine features in a GIS for use in hydrologic and hydraulic modeling software;**
- **Knowledge of spatial data, processes, and analysis combined with hydrologic and hydraulic tools to find solutions to common water resources management problems;**
- **Effective knowledge to present results of analyses in both oral and written formats.**
- **Knowledge in which ways GIS can facilitate more effective and/or more efficient water resource management;**
- **Ability to use GIS-based methods that address specific water resource challenges and problems**

Example course: Geographical Information Systems (GIS) and water resources management

Mode of Delivery:	**Face- to- face**
Prerequisites and co-requisites:	**None**
Recommended optional program components:	**None**

Course Contents: Lecture 1: Introduction to Geographic Information Systems, …

Lecture 2: Introduction to water resources management, …

Laboratory 3: Coordinates transformation,…

…….

Lecture 13: ……

Objective:

Scope of the course is the introduction of participants to the concepts, techniques and applications of Geographic Information Systems (GIS) to water resources management. Participants will learn the applications of GIS to hydrologic and hydraulic issues as well as assess online data sources, learn how to download and pre-process digital data, and analyze water information.

Example course: Geographical Information Systems (GIS) and water resources management

Mode of Delivery:	**Face- to- face**
Prerequisites and co-requisites:	**None**
Recommended optional program components:	**None**

Description:

- **Introduction to Geographical Information Systems**. Introduction to GIS, explanation of what is GIS Software and a GIS Application, instructions for getting and installing a GIS software for your own computer(s)
- **Spatial data and information in water resources and their management**. Type of data that are used by GIS for the management of water resources, data sources for vector and raster data and tabulate water related information
- **Vector and raster data**. Analysis of vector and raster data. Advantages and disadvantages of the use of these two type of data. Utilization of these data to water resources management implementation.
- **Topology in GIS**. Setting up of rules that, coupled with a set of editing tools and techniques, enables the geodatabase to more accurately model geometric relationships. Relationships between points, lines and polygons that represent the features of a geographic region
- **Database management systems in GIS**. Creation, maintenance, and the use of the database. Tools for adding, storing, changing, deleting, and retrieving data. Connection between datasets. Online databases for data retrieval.
- **Map algebra**. Description of how map algebra performs mathematical functions on raster grids…..

Example course: Geographical Information Systems (GIS) and water resources management

Recommended

or

required reading:

- **GIS Fundamentals: A first text on Geographic Information Systems, 4th (or 3rd) Edition; Paul Bolstad, Eider Press, 2012 (2008).**
- **Meijerink, A. M. J. et al. Introduction to the use of geographic information systems for practical hydrology. ITC publication no. 23, The Netherlands, 1994**
- **Bedient P.B., W.C. Huber, B.E. Vieux, 2008, Hydrology and Floodplain Analysis, Pearson, ISBN 0-13-174589-1**
- **David R. Maidment, 2002. Arc Hydro: GIS for Water Resources, ESRI Press, ISBN 1-58948-034-1.**

Planned learning activities and teaching methods	Class Instruction :42 hours Consultation : 15 hours	
Assessment methods and criteria:	Examinations	**0%**
	Assignment(s)	**100%**
Language of Instruction:	**English/Serbian**	
Work Placement(s):	**No**	
Place of Teaching:	**Regular Classroom / Remote access**	

Example course: Water Supply and Sewerage Systems

The following M1 - Course Information Form comes from AUTh, and it is different for each course class.

Administrative Information

The information in this section is obtained from and can only be edited through the Adminstration's Information System

Course Information

Title	ΥΔΡΕΥΣΕΙΣ - ΑΠΟΧΕΤΕΥΣΕΙΣ / Water Supply and Sewerage Systems
Code	TY2200
Faculty	Engineering
School	Civil Engineering
Cycle / Level	1st / Undergraduate
Teaching Period	Winter
Common	No
Status	Active
Course ID	20000261

Example course: Water Supply and Sewerage Systems

Programme of Study: PPS TMĪMATOS POLITIKŌN MĪCHANIKŌN (2018-2019)
Registered students: 561

Orientation	Attendance Type	Semester	Year	ECTS
Core program for all students	Compulsory Course	5	3	5

Programme of Study: PPS TMĪMATOS POLITIKŌN MĪCHANIKŌN (2017-2018)
Registered students: 6

Orientation	Attendance Type	Semester	Year	ECTS
KORMOS	Compulsory Course	5	3	5

Class Information

Academic Year	2018 – 2019
Class Period	Winter
Faculty Instructors	Panagiotis Prinos , Antigoni Zafeirakou
Instructors from Other Categories	Domniki Ioannidou
Weekly Hours	4

Example course: Water Supply and Sewerage Systems

Course Category

- ○ General Foundation
- ◉ Specific Foundation / Core
- ○ Knowledge Deepening / Consolidation

Mode of Delivery

- ☑ Face to face
- ☐ Distance learning

Digital Course Content

In URLs, if possible, prefer using an address specific to the particular class instead of a more general one. E.g. http://qa.auth.gr/class/1/000000001 instead of http://qa.auth.gr.

	URL
e-study Guide	https://qa.auth.gr/en/class/1/600118924
☑ At the Website of the School	http://www.civil.auth.gr/content/view/148/102/lang,el/
☑ eLearning (Moodle)	https://elearning.auth.gr/course/view.php?id=5999
☑ OpenCourses (eClass)	http://www.opencourses.gr/opencourse.xhtml?id=8461&ln=el
☐ Other 1	
☐ Other 2	

Erasmus

- ☐ The course is also offered to exchange programme students.

Example course: Water Supply and Sewerage Systems

Prerequisites

a. Required Courses

Select the courses that students must attend in order to be able to register to this course. Only for the programme of studies with the system of prerequisite courses and only the direct prerequisites.

- ☐ 125 OPERATIONS RESEARCH I
- ☐ 12EE09 INNOVATION AND ENTREPRENEURSHIP
- ☐ 224 BUSINESS ECONOMICS
- ☐ 364 SIMULATION
- ☐ 365 SUPPLY CHAIN MANAGEMENT
- ☐ ER000 Greece Today
- ☐ ER0033 TRANSPORT DEMANDS MODELS

b. General Prerequisites

Greek

English

Example course: Water Supply and Sewerage Systems

General Competences

Taking into account the generic competences that must be acquired by the graduates of AUTh (as they are described in the Diploma Supplement and presented as followed) which ones are intended by the course?

- ☑ Apply knowledge in practice
- ☑ Retrieve, analyse and synthesise data and information, with the use of necessary technologies
- ☑ Adapt to new situations
- ☑ Make decisions
- ☐ Work autonomously
- ☐ Work in teams
- ☐ Work in an international context
- ☐ Work in an interdisciplinary team
- ☐ Generate new research ideas
- ☑ Design and manage projects
- ☐ Appreciate diversity and multiculturality
- ☐ Respect natural environment
- ☐ Demonstrate social, professional and ethical commitment and sensitivity to gender issues
- ☐ Be critical and self-critical
- ☐ Advance free, creative and causative thinking

Example course: Water Supply and Sewerage Systems

Learning Outcomes Categorization

Select for every domain the levels covered by the learning outcomes of the course.

Cognitive Domain	Affective Domain	Psychomotor Domain
☑ Creating		
☐ Evaluating	☐ Characterization	☐ Naturalization
☑ Analysing	☐ Organization	☐ Articulation
☑ Applying	☐ Valuing	☐ Precision
☐ Understanding	☐ Response	☐ Manipulation
☐ Remembering	☐ Reception	☐ Imitation

Example course: Water Supply and Sewerage Systems

Levels of Intended Learning Outcomes

Select the highest levels of learning outcomes intended with this course. You should select the levels that correspond to the learning outcomes of the course, irrespective of the level of studies (undergraduate / postgraduate). The learning outcome level definitions provide an estimate of the demands of the course for the benefit of students and curriculum designers alike.

Knowledge means the outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices that is related to a field of work or study. In the context of the National Qualifications Framework, knowledge is described as theoretical and/or factual;'>Knowledge	Skills means the ability to apply knowledge and use know-how to complete tasks and solve problems. In the context of the National Qualifications Framework, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments);'>Competenca	Competence means the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development. In the context of the National Qualifications Framework, competence is described in terms of responsibility and autonomy.'>Skills
○ Level 8	○ Level 8	○ Level 8
○ Level 7	○ Level 7	○ Level 7
○ Level 6	○ Level 6	○ Level 6
○ Level 5	○ Level 5	○ Level 5
○ Level 4	○ Level 4	○ Level 4
○ Level 3	○ Level 3	○ Level 3
○ Level 2	○ Level 2	○ Level 2
○ Level 1	○ Level 1	○ Level 1
◉ No choice	◉ No choice	◉ No choice

Example course: Water Supply and Sewerage Systems

Greek

Α. Υδρεύσεις: Ποιοτικά και ποσοτικά δεδομένα νερού ύδρευσης. Ανάλυση και σχεδιασμός συστημάτων ύδρευσης. Υδροληψίες. Δεξαμενές αποθήκευσης. Υδραυλικοί υπολογισμοί εξωτερικών και εσωτερικών υδραγωγείων. Αντλιοστάσια και καταθλιπτικά δίκτυα. Υλικά κατασκευής δικτύων ύδρευσης. Τεχνικά έργα.

Β. Αποχετεύσεις: Ποιοτικά και ποσοτικά δεδομένα αστικών λυμάτων, βιομηχανικών αποβλήτων και ομβρίων. Ανάλυση και

English

Water supply systems: Historic review of wss. Public water demand. Drinking water quality and quantity measurements. Sources and pumping wells. Aquifer recharge. Storage reservoirs. Pumping stations and pressure pipes. Design of water supply networks. Water transfer mains and distribution networks. Branched and Looped networks. Selection of pipe diameter and material. Construction and fitting of pipes (depth, slopes).
Sewerage systems: Historic review of sewerage systems. Quantity and quality of waste water (residential, industrial,

Keywords

Υδρεύσεις, Αποχετεύσεις, Σχεδιασμός, Ανάλυση, Δίκτυα Διανομής, Εργα Μηχανικού (Greek)

Water supply, Sewerage, Design, Analysis, Distribution Networks, Enginnering works (English)

Please enter comma delimited terms

Educational Material Types

- [x] Book
- [x] Notes
- [x] Slide presentations
- [ ] Video lectures
- [ ] Podcast
- [ ] Audio
- [ ] Multimedia
- [x] Interactive excersises
- [ ] Other (Greek) (English)

Example course: Water Supply and Sewerage Systems

Use of Information and Communication Technologies

a. Use of ICT

- [x] Use of ICT in Course Teaching
- [ ] Use of ICT in Laboratory Teaching
- [x] Use of ICT in Communication with Students
- [x] Use of ICT in Student Assessment

b. Description

Greek

English

Example course: Water Supply and Sewerage Systems

Course Organization

The column 'Hours of Instruction' has been removed and ECTS units are now calculated automatically. Please fill in the 'Workload' for each course activity.
Workload: Total hours of student effort for a respective activity for the semester. Includes class hours, lab hours, field work etc.
The total workload for the course, according to its ECTS units, should be 140 hours.

Activities	Workload	ECTS *	Individual	Teamwork	Erasmus
☑ Lectures	125	4.5	☐	☑	☐
☑ Seminars	4	0.1	☐	☑	☐
☐ Laboratory Work			☐	☐	☐
☐ Fieldwork			☐	☐	☐
☐ Reading Assigment			☐	☐	☐
☐ Tutorial			☐	☐	☐
☐ Internship			☐	☐	☐
☐ Clinical Practice			☐	☐	☐
☐ Artistic Workshop			☐	☐	☐
☐ Interactive Teaching in Information Center			☐	☐	☐
☑ Field trips and participation in conferences / seminars / activities	8	0.3	☐	☑	☐
☐ Project			☐	☐	☐
☐ Written assigments			☐	☐	☐
☐ Artistic creation			☐	☐	☐
☑ Exams	3	0.1	☐	☑	☐
☐ Other / Others (Greek) (English)			☐	☐	☐
Total	**140**	**5**			

* One ECTS unit corresponds to 28 hours of workload.

Example course: Water Supply and Sewerage Systems

Student Assessment

a. Description of the procedure (if there are expressly defined evaluation criteria, what they are or where they can be found) and weight of each evaluation method.

Greek

Οι φοιτητές εξετάζονται σε ασκήσεις στα 2 αντικείμενα του μαθήματος: Υδρεύσεις, Αποχετεύσεις. Η βαθμολογία ακολουθεί μια κατανομή των 10 μονάδων, 50%-50%. Δίνονται σαφείς οδηγίες ως προς τα βοηθήματα που μπορούν να χρησιμοποιήσουν κατά τη διάρκεια της εξέτασης.

English

Students are examined with open books in both subjects: Water supply and Sewerage. One exercise in each subject. Sometimes there are theoretical questions. Grading is distributed 50%-50%. Specific directions are given prior to the exam, on the material that can be used during the examination.

b. Assessment methods

	Formative	Summative
Written Exam with Multiple Choice Questions	☐	☐
Written Exam with Short Answer Questions	☐	☑
Written Exam with Extended Answer Questions	☐	☐
Written Exam with Problem Solving	☐	☑
Written Assignment	☐	☐
Report	☐	☐
Oral Exams	☐	☐
Performance / Staging	☐	☐
Labortatory Assignment	☐	☐
Clinical Examination of Patient	☐	☐
Artistic Performance	☐	☐
Other / Others (Greek) (English)	☐	☐

Example course: Water Supply and Sewerage Systems

Bibliography

a. Course bibliogrpahy (Eudoxus)

Υδραυλικά Έργα, Σχεδιασμός και Διαχείριση, Τόμος Ι: Αστικά Υδραυλικά Έργα, Τσακίρης Γεώργιος

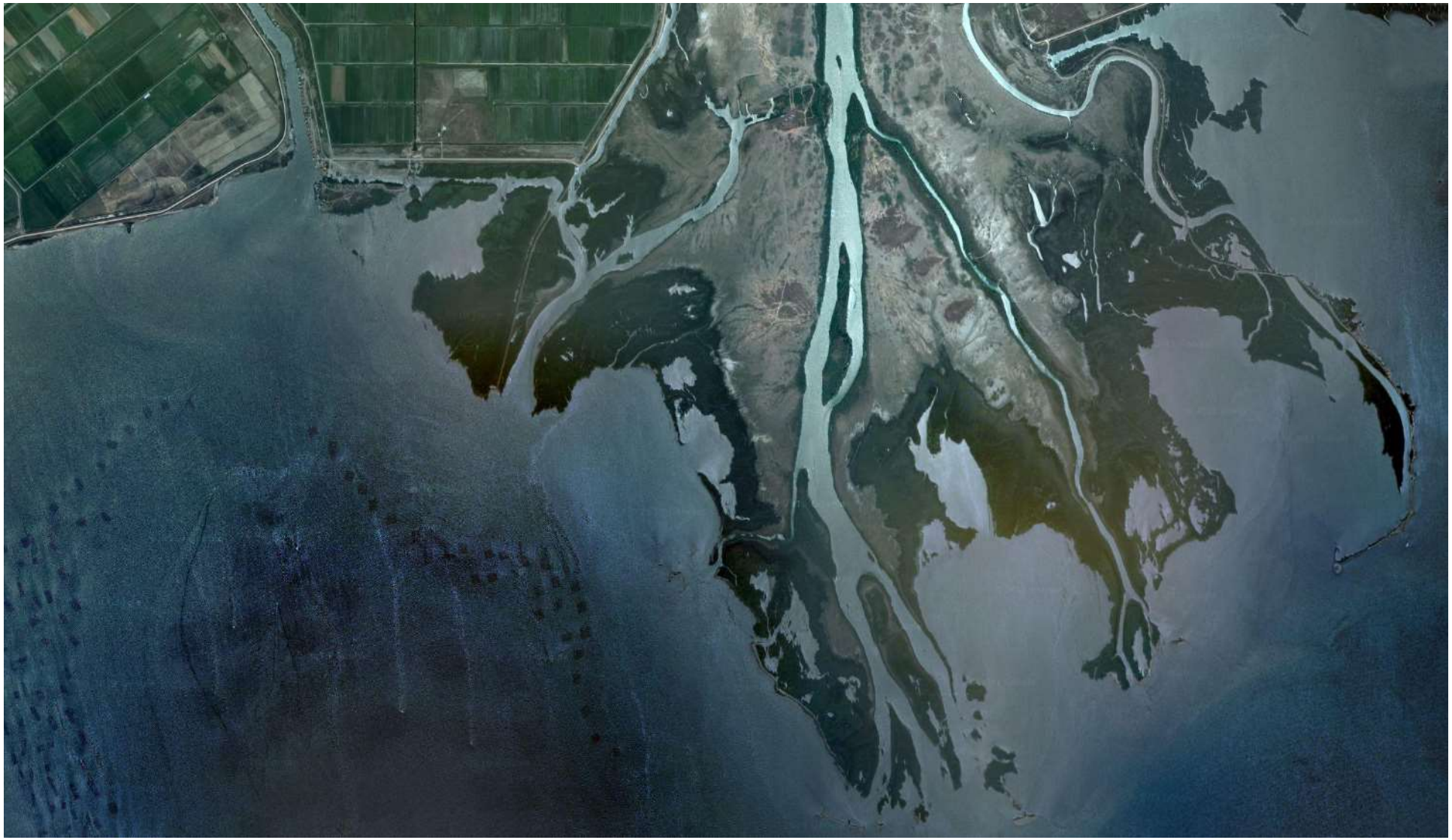
b. Additional bibliography for study

α) Σημειώσεις καθ. Η. Χατζηαγγέλου (2002)
- Τεύχος 1: Τεχνική υδρομηχανική
- Τεύχος 2: Αντλίες και καταθλιπτικοί αγωγοί
- Τεύχος 3: Υδρεύσεις
- Τεύχος 4: Αποχετεύσεις

Student Questionnaire

Save

Last Update: 11-05-2016



Thank you for your attention!

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