COURSE OUTLINE Water storage techniques and technical works in Mediterranean conditions

EDUCATION LEVEL	7		
CODE	WBCC-512ws	SEMESTER	2nd
TITLE	Water storage techniques and technical works in Mediterranean conditions		
TEACHING ACTIVITIES	HOURS/WEEK	ECTS	
Lectures, exercises	3	6	
TYPE OF COURSE	Main course in the specialization «Water scarcity»		
PREREQUISITE KNOWLEDGE	-		
LANGUAGE OF INSTRUCTION AND ASSESSMENT	Greek		
AVAILABILITY TO ERASMUS STUDENTS	-		
WEBSITE (URL)	https://eclass.uoa.gr/courses/GEOL575/		

LEARNING OUTCOMES

Learning Outcomes/Subject Specific Competences
The course consists of a theoretical part and practical exercises that contribute to the understanding of real applications regarding the sizing and simulation of the operation of similar hydraulic projects. In the context of the course, a variety of subjects related to water resources management and relevant technical works is covered, and finally, the subject of water demand for several uses, as well as water saving methods, is covered in depth. Upon successful completion of the course, postgraduate students will be able to: Understand the importance of water resources in economic development on a local-regional-national level and also the limitation that the lack of water resources poses to the general well-being of societies. Also, among the purposes of the course is to understand the competing uses of water and students will be able to evaluate different alternatives to cover the demand. Analyse data related to water demand/supply/consumption, as well as to estimate the demand for individual uses, through the application of appropriate methodologies and scenarios. Define the concept of the hydro system, as a network-representation, and determine the necessary quantities for simulating similar systems. Formulate a simple optimization problem mathematically, plot it in digital worksheets, while understanding basic statistical concepts such as reliability is also included. Become familiar with concepts such as model sensitivity and uncertainty analysis, synthetic time series and MonteCarlo sampling. Assess the impacts on water resources from human activities. Develop sustainable water conservation and saving plans at different scales (home, city, etc.). Apply water collection and conservation practices and techniques at different scales and for different environments. Understand the effects of climate change on water resource management, especially in areas characterized by water deficit. Finally, in the context of the course, through the assignments, the cooperation between the students is encouraged for the preparation of two semester projects.

Generic Competences
Search, analyze and synthesize data and information Literature review Decision making Process understanding Individual and Team work Project planning and management Cultivating respect for the natural environment

COURSE CONTENT

The sustainability of water resources is a critical issue that will concern society in the coming decades. Water resources are affected by changes not only in climate but also in population, economic development, technological change and other social and economic factors. Moreover, they serve a dual purpose: water resources are critical to both human society and natural ecosystems.

The objective of this course is to initially provide students with the opportunity to explore various sustainable strategies for integrated water resources management in water scarcity conditions. Students will also be taught water collection and conservation techniques for different environments (natural, artificial). Case studies will be highlighted throughout the course to illustrate real-world conditions and challenges faced by water managers as well as ways to apply water conservation techniques, utilizing historical time series and applying climate change scenarios. Educational objects:

Explaining the importance of water for maintaining balance in the Biosphere.
Explaining the importance of water conservation and the corresponding methods that help it in semi-arid and arid environments.
Learning water saving practices and techniques for domestic, local, industrial and agricultural use.
Studies and construction techniques of small dams and reservoirs.
• Construction techniques of surface and underground water storage tanks.

LEARNING ACTIVITIES - TEACHING and ASSESSMENTS METHODS

<table>
<tr><td>MODE OF DELIVERY</td><td>Distance learning</td></tr>
<tr><td>USE OF INFORMATION AND COMMUNICATION TECHNOLOGY</td><td>In Teaching:
– Presentations using multimedia (images, animation, video).
– Use of computers and specialized software and / or the use of MS programs (mainly MS Excel).
– Completion of questionnaires.
– PowerPoints (ppt) uploads in the e-class platform.
In Communication with students:
– Support of the learning process through the electronic platform e-Class (announcements, information, messages, documents, assignments, questionnaires, exercises, diary, user groups, multimedia, links, grading, e-book, etc.), and through personal contact.</td></tr>
<tr><td>PLANNED LEARNING ACTIVITIES</td><td><table><tr><th>Activity</th><th>Semester Workload</th></tr><tr><td>Lectures</td><td>3 hrs x 13 weeks</td></tr><tr><td>Practice Exercises</td><td>10 h</td></tr><tr><td>Individual Project</td><td>40 h</td></tr><tr><td>Group Project</td><td>50 h</td></tr><tr><td>Total</td><td>139 h</td></tr></table></td></tr>
<tr><td>ASSESSMENT METHODS AND CRITERIA</td><td>Assignments (projects, reports, presentations): 100%, from which
Individual Project 50%
Group Project and presentation 50%</td></tr>
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TEXTBOOKS - BIBLIOGRAPHY

Jones, J.A.A. Water Sustainability: A Global Perspective. Routledge pp. 464. (2010)
Vickers, A. Handbook of Water Use and Conservation. Waterplow Press pp. 446 (2010)
Mimikou, M., Baltas, E. and Tsihrintzis, V. (2016). Hydrology and Water Resource Systems, CRC Press, Taylor and Francis Group.
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