

COURSE OUTLINE Surface Water Resources Management

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| EDUCATION LEVEL | 7 | | |
| CODE | WBCC-504 | SEMESTER | 1 st |
| TITLE | Surface Water Resources Management | | |
| TEACHING ACTIVITIES | HOURS/WEEK | ECTS | |
| Lectures, Practice exercises, homeworks | 3 | 6 | |
| TYPE OF COURSE | Basic course - Compulsory core courses | | |
| PREREQUISITE KNOWLEDGE | - | | |
| LANGUAGE OF INSTRUCTION AND ASSESSMENT | Greek | | |
| AVAILABILITY TO ERASMUS STUDENTS | - | | |
| WEBSITE (URL) | https://eclass.uoa.gr/courses/GEOL573/ | | |

LEARNING OUTCOMES

Learning Outcomes/Subject Specific Competences

The course consists of a theoretical part accompanied with practical exercises that contribute to the understanding of the integrated and sustainable management of surface water resources. In the context of the course, a broad range of scientific knowledge is taught in regard to the hydrological cycle, surface water resources, their uses and the problems they face, impending effects of climate change and methods of their integrated management.

Upon successful completion of the course, graduate students will be able to:

Understand the importance of integrated and sustainable surface water resources for the economic development of a region, the well-being of citizens and the welfare of ecosystems

Delineate the watershed and estimate its different characteristics necessary for its management

Understand the hydrological cycle and its processes as well as the water budget at the watershed scale

Know the important geomorphological processes and how they affect surface water resources.

Assess the impacts on water resources from human activities and implement best practices to mitigate their impacts.

Implement different surface water resource management systems for their sustainable management with the active participation of stakeholders.

Understand the types of erosion, the negative effects on water resources and the impending problems of desertification in the Mediterranean.

Apply practices and techniques to mitigate the effects of erosion at different scales and for different ecosystems.

Understand the effects of climate change on water resource management and what changes in management practices can promote the sustainability of water resources.

Finally, within the course, the interdisciplinary approach to the integrated and sustainable management of surface water resources is encouraged.

Generic Competences

Search, analyse and synthesize data and information

Promote free, creative and inductive thinking

Literature review

Autonomous work

Decision making

Work in an interdisciplinary environment

Respect for the natural environment

COURSE CONTENT

Surface water resources are vital to the economic development and well-being of a country's citizens. In many countries and regions of the world surface water resources are limited. Finally, water resources are essential for the maintenance of ecosystems as well as the services they offer to humans. The multiple uses of water, the effects of climate change, population growth, urbanization and the increase in water pollution, make their integrated and sustainable management a priority.

The objective of this course is to initially provide the basic background on surface water resources that includes the concepts of the watershed and its characteristics, as well as an understanding of water cycle and geomorphologic processes. The students will be taught what the important parameters for the management are of water resources as well as how to estimate them. In addition, they will be trained in sustainable water management methods and best practices to mitigate the negative effects of anthropogenic activities and climate change. During the lessons, case studies will be presented to present real-life examples of the conditions and challenges that water managers face routinely.

Educational objects:
 Explanation of the importance of the hydrological cycle and geomorphological processes.
 Delineation and estimation of important parameters of watersheds necessary for their sustainable management.
 Learning integrated and sustainable water resource management systems with the active participation of stakeholders.
 Understanding erosion and desertification and their correlation to water resources
 • Best practices for mitigating the effects of pollution and climate change on water resources

LEARNING ACTIVITIES - TEACHING and ASSESSMENTS METHODS

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| MODE OF DELIVERY | Distance learning | |
| USE OF INFORMATION AND COMMUNICATION TECHNOLOGY | 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. | |
| PLANNED LEARNING ACTIVITIES | Activity | Semester Workload |
| | Lectures | 3 hr x 13 weeks |
| | Practice Exercises | 30 hr |
| | Individual Project | 70 hr |
| | Total | 139 hr |
| ASSESSMENT METHODS AND CRITERIA | Individual Exercises 20% Individual HomeWorks 30% Final Exams 50% | |

TEXTBOOKS - BIBLIOGRAPHY

Brooks K.N., Ffolliott P.F., Magner J.A. 2012 Hydrology and the management of watersheds. 4th Edition, Wiley-Blackwell.
 Mysiak J., Hans Jorgen Henrikson H.J., et al. 2013. The Adaptive Water Resource Management Handbook Routledge
 Borchardt D., Bogardi J.J., et al. 2016 Integrated Water Resources Management: Concept, Research and Implementation. Springer.
 Yousuf A., Singh M. (eds.) 2019. Watershed Hydrology, Management and Modeling. 2019. CRC Press.
 MedECC 2020 Climate and Environmental Change in the Mediterranean Basin – Current Situation and Risks for the Future. First Mediterranean Assessment Report [Cramer, W., Guiot, J., Marini, K. (eds.)] Union for the Mediterranean, Plan Bleu, UNEP/MAP
 Zaimis G.N. and D. Emmanouloudis. 2012. Sustainable Management of the Freshwater Resources of Greece. Journal of Engineering Science and Technology Review 5(1):77-82.
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