

WATER RESOURCES MANAGEMENT

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
DEPARTMENT	AGRICULTURE		
LEVEL OF COURSE	UNDERGRADUATE		
COURSE CODE	AGR_904	SEMESTER OF STUDIES	9 th
COURSE TITLE	Water Resources Management		
INDEPENDENT TEACHING ACTIVITIES <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>	TEACHING HOURS PER WEEK	ECTS CREDITS	
Lectures	3	5	
Seminars	1		
Total	4		
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	SPECIALISED GENERAL KNOWLEDGE, SKILLS DEVELOPMENT		
PREREQUISITE COURSES:	Typically, there are not prerequisite courses.		
TEACHING AND ASSESSMENT LANGUAGE:	Greek. Teaching may be however performed in English in case foreign students attend the course.		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBPAGE (URL)			

2. LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

The course aims at the acquisition of essential knowledge considering the management of water resources, for the students of the Department of Agriculture.

By the end of this course the students will be able to:

1. Estimate and manage the demand for various water uses
2. Apply water resources management techniques.
3. Understand the basic and critical features of water resources development, their connection with the global financial and operational objectives along with decision-making principles, especially in water crisis conditions, e.g. drought,

desertification, floods, environmental degradation etc.

- Understand and estimate the modern concepts of water management in agriculture, such as the Water Footprint of the agricultural products.

General Abilities

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Adapting to new situations

Decision-making

Working independently

Team work

Working in an international environment

Working in an interdisciplinary environment

Production of new research ideas

Project planning and management

Respect for difference and multiculturalism

Respect for the natural environment

Showing social, professional and ethical responsibility and sensitivity to gender issues

Criticism and self-criticism

Production of free, creative and inductive thinking

Generally, by the end of this course the student will, furthermore, have develop the following general abilities (from the list above):

Search for, analysis and synthesis of data and information, with the use of the necessary technology

Adapting to new situations

Decision-making

Working independently

Team work

Production of free, creative and inductive thinking

Working in an interdisciplinary environment

Respect for the natural environment

Production of new research ideas

3. SYLLABUS

- Concept and components of water resources management
- Legislation framework for the protection and management of water resources
- Water management authorities
- Water resources management at national and international level
- Water resources development works and hydrosystems
- Water resources availability and water uses
- Management of water demand
- Design, planning, operation and maintenance of hydrosystems
- Strategies for sustainable and integrated management of water resources
- Techniques of water resources management: empirical approaches, mathematical analysis and programming, multi-objective analysis, decision support systems
- Virtual water and water footprint
- Economic and social aspects
- Water pricing

4. TEACHING AND LEARNING METHODS - EVALUATION

TEACHING METHOD <i>Face-to-face, Distance learning, etc.</i>	Lectures and problem-solving seminars.
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	Use of Information and Communication Technologies (ICTs) (e.g. powerpoint) in teaching.

<p><i>Use of ICT in teaching, laboratory education, communication with students</i></p>	<p>Direct communication with the students (face to face and by e-mail), Support of the learning process and uploading of the educational material to the electronic platform (e-class): https://eclass.upatras.gr</p>	
<p><i>The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc.</i></p> <p><i>The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS</i></p>	Activity	Semester workload
	<p>Lectures and seminars (4 contact hours per week x 13 weeks) and teamwork case study</p>	52
	<p>Mid-term examinations (2 mid-term examinations x 2 contact hours each)</p>	4
	<p>Two day field trip (2 days x 7 contact hours each day)</p>	14
	<p>Hours for private study of the student / preparation of the teamwork case study and preparation for mid-term or/and final examination / Final examination</p>	55
<p>Total number of hours for the Course (25 hours of work-load per ECTS credit)</p>	125 hours (total student work-load)	
<p style="text-align: center;">STUDENT PERFORMANCE EVALUATION</p> <p><i>Description of the evaluation procedure</i></p> <p><i>Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other</i></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<ol style="list-style-type: none"> Optionally, two mid-term examinations with the final examination grade to be the mean mark, for the theoretical part. It is mandatory to obtain pass grade (≥ 5) in each examination. Written examination after the end of the semester. Minimum passing grade: 5. <p>Evaluation of theoretical part (75%) Written examination. It is mandatory to obtain pass grade (≥ 5).</p> <p>Evaluation of the teamwork case study (25%) Oral examination – Public presentation. It is mandatory to obtain pass grade (≥ 5).</p> <p>All the above are taking place in Greek as well as in English for foreign students (e.g. ERASMUS students) if any.</p>	

5. RECOMMENDED LITERATURE

1. Grigg, N. S., 1996, "Water Resources Management", McGraw - Hill, New York.
2. Mays, L. W., and Y. - K. Tung, 1992, "Hydrosystems Engineering and Management", McGraw-Hill, New York.
3. Loucks, D.P., E. van Beek, J.R. Stedinger, J.P.M. Dijkman, 2005, "Water Resources Systems Planning and Management, An Introduction to Methods, Models and Applications, Studies and Reports in Hydrology", UNESCO Publishing, Paris