

POLLUTION AND PROTECTION OF THE RURAL ENVIRONMENT

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	CROP SCIENCE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	CRS_703	SEMESTER	7 th
COURSE TITLE	Pollution and Protection of the Rural Environment		
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>	WEEKLY TEACHING HOURS	CREDITS	
lectures	3		
Tutorials	1		
TOTAL	4	5	
<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>	Specialized General Knowledge (Pollution-Water Quality) skills development (Pollution assessment and qualitative analysis of environmental samples)		
PREREQUISITE COURSES:	Typically, there are no prerequisite courses. However, students should have basic knowledges on General & Analytical Chemistry		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek. Teaching may be performed in English in case foreign students attend the course.		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)		
COURSE WEBSITE (URL)			

2. LEARNING OUTCOMES

<p>Learning outcomes <i>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</i></p> <ul style="list-style-type: none"> • <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> • <i>Guidelines for writing Learning Outcomes</i>
<p>By the end of this course the student will be able to:</p> <ul style="list-style-type: none"> • understand the organoleptic, physical and chemical characteristics of the environmental studies • know the most important sources of environmental and water pollution • know the basic techniques for purification of the rural environment • know the sampling techniques and apply the correct sampling rules and methodologies • deepen on the basic analytical techniques for determining the quality of environmental samples • choose the appropriate method of analysis and plan the experimental procedure for qualitative and quantitative analysis of basic water quality parameters • know the most important water quality regulations for different uses
<p>General Competences <i>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?</i></p>

<i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i> <i>Adapting to new situations</i> <i>Decision-making</i> <i>Working independently</i> <i>Team work</i> <i>Working in an international environment</i> <i>Working in an interdisciplinary environment</i> <i>Production of new research ideas</i>	<i>Project planning and management</i> <i>Respect for difference and multiculturalism</i> <i>Respect for the natural environment</i> <i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i> <i>Criticism and self-criticism</i> <i>Production of free, creative and inductive thinking</i> <i>.....</i> <i>Others...</i>
<ul style="list-style-type: none"> • By the end of this course the student will, furthermore, have developed the following skills (abilities): • Ability to write and present work related to the subject • Ability to compare different methods of analysis for measuring and determining environmental parameters • Ability to interact for issues of interdisciplinary nature • Ability to search for regulations and legislation on the protection and quality of water and environment • Study skills needed for continuing professional development <p>Generally, by the end of this course the student will have developed the following general abilities (from the above list)</p> <ul style="list-style-type: none"> • 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 • Respect for the natural environment • Criticism and self-criticism 	

3. SYLLABUS

<p>Lectures</p> <ol style="list-style-type: none"> 1. Pollution and Environmental Protection 2. Natural Water and Wastewater: Natural and Chemical Characteristics of Natural Water 3. Processes in natural waters 4. Pollution of Water Systems (Pollution from Organic Wastes, Suspended Solids, Heat Pollution) 5. Pollution of Water Systems (Pollution from Pharmaceuticals, Heavy Metals) 6. Bioaccumulation of pollutants 7. Eutrophication, Eutrophication Indicators of Water 8. Microbial contamination of water 9. Natural water-purification mechanisms 10. Purification of potable water 11. General Principles of Water and Waste Water Purification 12. Biological Waste Water Treatment Advanced Oxidation 13. Processes for water and wastewater treatment 14. Water Quality Regulations: Potable Water, Water for Animal Production, Fisheries and Aquaculture
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4. TEACHING AND LEARNING METHODS - EVALUATION

<p style="text-align: center;">DELIVERY</p> <p style="text-align: center;"><i>Face-to-face, Distance learning, etc.</i></p>	<p>Face to face.</p> <p>During the course, students are asked to write and present a brief bibliography project on actual pollution problems as well as water quality techniques.</p> <p>Laboratory exercises on the analysis of environmental and water quality parameters.</p>
<p style="text-align: center;">USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</p>	<ul style="list-style-type: none"> • Use of ICT (powerpoint) in teaching • Use of ICT (powerpoint) in laboratory exercises

<p><i>Use of ICT in teaching, laboratory education, communication with students</i></p>	<ul style="list-style-type: none"> • Use of ICT in Student Communication (Learning Support through the e-class platform) 																	
<p>TEACHING METHODS <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>	<table border="1"> <thead> <tr> <th data-bbox="667 309 978 365">Activity</th> <th data-bbox="994 309 1465 365">Semester workload</th> </tr> </thead> <tbody> <tr> <td data-bbox="667 376 978 432">Lectures (3 contact hours per week x 13 weeks)</td> <td data-bbox="994 376 1465 432">39</td> </tr> <tr> <td data-bbox="667 443 978 499">Seminars</td> <td data-bbox="994 443 1465 499">12</td> </tr> <tr> <td data-bbox="667 510 978 566">literature review</td> <td data-bbox="994 510 1465 566">13</td> </tr> <tr> <td data-bbox="667 577 978 633">Writing and presentation of a brief project</td> <td data-bbox="994 577 1465 633">13</td> </tr> <tr> <td data-bbox="667 645 978 701">Final examination</td> <td data-bbox="994 645 1465 701">3</td> </tr> <tr> <td data-bbox="667 712 978 813">Hours for private study of the student and preparation for mid-term or/and final examination – Participation in the examinations</td> <td data-bbox="994 712 1465 813">45</td> </tr> <tr> <td data-bbox="667 824 978 902">Total number of hours for the Course (25 hours of work-load per ECTS credit)</td> <td data-bbox="994 824 1465 902">125 hours (total student work-load)</td> </tr> </tbody> </table>	Activity	Semester workload	Lectures (3 contact hours per week x 13 weeks)	39	Seminars	12	literature review	13	Writing and presentation of a brief project	13	Final examination	3	Hours for private study of the student and preparation for mid-term or/and final examination – Participation in the examinations	45	Total number of hours for the Course (25 hours of work-load per ECTS credit)	125 hours (total student work-load)	
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<p>STUDENT PERFORMANCE EVALUATION <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>	<ul style="list-style-type: none"> • Project (A) • Written final examination (B) <p>Each case is graded on a scale of 0-10 Final grade (FG): $FG = 0.35A + 0.65B$</p> <ul style="list-style-type: none"> • <i>Minimum passing grade: 5 (Grade: 0-10)</i> <p>Greek language is used. For foreign students (e.g. Erasmus students) it can be done in English</p> <p>In the case of failure, the grade of the work (A) and the individual laboratory exercises (B) is retained and only the final written examination is repeated</p>																	

5. ATTACHED BIBLIOGRAPHY

- Suggested bibliography:
1. Water pollution control, Wiley, Editor(s): Suresh T. Nesaratnam First published: 2014
- Related academic sources and journals:
1. Water Research (Elsevier) <https://www.journals.elsevier.com/water-research/>
 2. Standard Methods for the examination of water and wastewater, 22nd Edition (2014)