COURSE OUTLINE

1. GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
ACADEMIC UNIT	AGRICULTURE		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	AGRI_EE8	**SEMESTER**	8th
COURSE TITLE	ENVIRONMENTAL FLUID MECHANICS		

INDEPENDENT TEACHING ACTIVITIES *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*	**WEEKLY TEACHING HOURS**	**CREDITS**
lectures	2	
laboratory exercises	2	
TOTAL	4	5
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	Special background Specialized general knowledge
PREREQUISITE COURSES:	Typically, there are not prerequisite course.
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 (English)
COURSE WEBSITE (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*

Upon successful completion, students will have the knowledge and skills to:

1. Interpret and explain environmental water flows at small, large and global scale.
2. Explain the physical principles of convection, fluid momentum, viscous forces, drag and diffusion.
3. Calculate the static and dynamic forces on engineering structures due to water flows.
4. Design pipe and channel sizes for specified water flows
5. Evaluate the environmental impact on water flows of engineered water management systems (including dams, pipes and channels).

General Competences

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
……
Others…

By the end of this course the student will have the general skills:

1. Apply knowledge of science and engineering fundamentals
2. Ability to undertake problem identification, formulation and solutions.
3. Communicate effectively with the engineering team and with the community at large.
4. Be creative and innovative.
5. Ability to function effectively as an individual and in multidisciplinary and multicultural teams, as a team leader or manager as well as an effective team member
6. Search for, analysis and synthesis of data and information, with the use of the necessary technology
7. Team work
8. Project planning and management

3. SYLLABUS

1. Equations of motion for boundary layers
2. Hydraulic characteristics of open channel flow
3. Surface and internal wave theory
4. Advection diffusion equation
5. Sediment and associated contaminant transport in lakes and streams
6. Mixed layer modeling in lakes
7. Remediation
8. Transport processes at the air/water interface
9. Turbulent diffusion
10. Heat and mass transport in porous media
11. Water quality modelling in reservoirs

Laboratory exercises:

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY *Face-to-face, Distance learning, etc.*	Face-to-face lectures.
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY *Use of ICT in teaching, laboratory education, communication with students*	• Use of Information and Communication Technologies (ICTs) (e.g. powerpoint) in teaching. • Use of ICTs in student communication (learning support through the e-class platform).
TEACHING METHODS *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.* *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*	
STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *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*	Final mandatory written examination, full length questions and / or multiple-choice questions. Minimum pass grade= 5, scale 0-10. All the above are taking place in Greek as well as in English for foreign students (e.g. ERASMUS students) if any.

Activity	***Semester workload***
Lectures (2 conduct hours per week x 13 weeks)	26
Tutorials (2 conduct hours per week x 13 weeks)	26
Hours for private study of the student and preparation for mid-term or/and final examination – Participation in the examinations	73
Course total	**125 hours**

interpretation, other *Specifically-defined evaluation criteria are given, and if and where they are accessible to students.*	

5. ATTACHED BIBLIOGRAPHY

-Suggested bibliography:.

Environmental Fluid Mechanics, Hillel rubin, CRC Press

- Related academic journals:

Geophysical and Environmental Fluid Mechanics MDPI