

COURSE OUTLINE

1. GENERAL

SCHOOL	Environment and Agricultural Engineering		
ACADEMIC UNIT	Natural Resources Management and Agricultural Engineering		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	198	SEMESTER	8 th
COURSE TITLE	Hydrology		
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
	Theory	3	3
	Laboratory	2	2
	TOTAL:	5	5
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	general background		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (In 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*

It is a basic course in the scientific field of Surface Water Hydrology.

The course content aims to introduce students to the basic concepts of Hydrology, such as the watershed and its characteristics, hydrographs, the processes of the hydrological cycle (precipitation, evapotranspiration, infiltration, runoff), and the water balance.

The aim of the course is to understand the importance of hydrology in water resources management, as well as in the design of related water resource development/utilization projects.

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

- Conduct measurements of hydrological elements.
- Calculate the basic parameters of the water balance.
- Study runoff, peak flows, and floods.
- Perform statistical analysis of hydrological data.
- Understand the applications of hydrology in the design of hydraulic and land reclamation projects.

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

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Others...

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- Search, analysis, and synthesis of data and information, using the necessary technologies
- Independent Work
- Generation of new research ideas
- Project Design and Management
- Protection of the natural environment/mitigation of impacts alongside project development

3. SYLLABUS

- i. Physiographic and climatic characteristics of a watershed.
- ii. Branches of hydrology, hydrological cycle, and water balance. Hydrological information (measurements, data, networks, processing). Atmospheric precipitation (meteorological framework, surface and satellite measurements, processing of point rainfall information, surface integration).
- iii. Basic principles of evaporation, transpiration, water retention, and infiltration.
- iv. Surface runoff, baseflow - groundwater runoff. Introduction to groundwater hydrology - aquifer recharge.
- v. General, watershed, reservoirs. Applications – hydrological design of reservoirs.
- vi. Hydrometry, measurement of hydrometeorological parameters.
- vii. Runoff – Floods – Hydrographs – Peak discharge.
- viii. Unit hydrographs - Synthetic hydrographs.
- ix. Hydrograph routing.
- x. Statistical analysis of hydrological data.
- xi. Applications of hydrology in the design of hydraulic and land reclamation projects.

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	The teaching methodology employed in the classroom involves active student participation through interactive question and answer sessions.	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Specialized Hydrological Simulation Software e-class platform	
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>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> <i>The student's study hours for each learning activity</i>	Activity	Semester workload (hours)
	Lectures	39
	Practical exercises focusing on the application of methodologies and case	26

<i>are given as well as the hours of non-directed study according to the principles of the ECTS</i>	study analysis in small teams of students.		
	Educational field trip / Small individual practice assignments	20	
	Study at home	40	
	TOTAL	125	
STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i> <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> <i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i>	I. Final written examination (50%) which includes: <ul style="list-style-type: none"> • Multiple choice questions • Short answer questions • Solving simple problems II. Final written examination (50%) on the subjects of laboratory exercises and laboratory assignments.		

5. ATTACHED BIBLIOGRAPHY

- Koutsoyiannis D. and Th. Xanthopoulos, Technical Hydrology, 3rd Edition, doi:10.13140/RG.2.1.4856.0888, National Technical University of Athens, Athens,
- Sakkas I., 2004, Technical Hydrology Volume 1 Surface Water Hydrology, AIVAZI Publications.
- Chow V.T., Maidment D.R., Mays L. W., Applied Hydrology, McGraw-Hill, Inc.
- Dingman S.L., 2002, Physical Hydrology, Second Edition. Prentice-Hall, Inc.
- Linsley K.Ll., Kohler M. A., Paulus J.H., Hydrology for Engineers. McGraw-Hill, Inc.

Relevant scientific journals:

- Journal of Hydrology
- Hydrological Sciences Journal
- Water, MDPI
- Advances in Water Resources