COURSE OUTLINE

1. GENERAL INFORMATION

FACULTY/SCHOOL	SCHOOL OF PLANT SCIENCES		
DEPARTMENT	CROP SCIENCE		
LEVEL OF STUDY	*Undergraduate (Elective)*		
COURSE UNIT CODE	264	**Semester:**	9th
COURSE TITLE	Applied Hydrometeorology		
INDEPENDENT TEACHING ACTIVITIES *in case credits are awarded for separate components/parts of the course, e.g. in lectures, laboratory exercises, etc. If credits are awarded for the entire course, give the weekly teaching hours and the total credits*		**WEEKLY TEACHNG HOURS**	**ECTS**
	Lectures	3	3
	Laboratory Exersices	2	2
Add rows if necessary. The organization of teaching and the teaching methods used are described in detail under section 4			
COURSE TYPE *Background knowledge, Scientific expertise, General Knowledge, Skills Development*	*Scientific expertise*		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION:	Greek		
LANGUAGE OF EXAMINATION/ASSESSMENT:			
THE COURSE IS 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 (certain) level, which students will acquire upon successful completion of the course, are described in detail. It is necessary to consult:

APPENDIX A

- *Description of the level of learning outcomes for each level of study, in accordance with the European Higher Education Qualifications' Framework.*
- *Descriptive indicators for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and*

APPENDIX B

- *Guidelines for writing Learning Outcomes*

The aim of the course is to familiarize students with hydrometeorology-hydroclimatology issues with an emphasis on the atmospheric and terrestrial phase of the hydrological cycle and the related spatial and temporal scales under conditions of changing climate in the Mediterranean Basin, the assessment of the Water Balance in Agricultural / Rural Areas, in Technical Hydrology and Technical Works in Agricultural Areas and in winter phenomena in Greece and their control with agro-technical and horticultural projects. The laboratory exercises (in the classroom and in the field) aim to familiarize students with methodologies for the analysis, processing and assessment of hydrometeorological and hydroclimatic parameters in agricultural and rural areas.

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

- Have an understanding of the methods of analysis, estimation and simulation of hydrometeorological and hydroclimatic

parameters at different time and spatial scales.
- Collaborate with fellow students to develop and present a study on the utilization of the water potential of an agricultural or rural area under changing climate conditions in the Mediterranean Basin.

General Competences

Taking into consideration the general competences that students/graduates must acquire (as those are described in the Diploma Supplement and are mentioned below), at which of the following does the course attendance aim?

Search for, analysis and synthesis of data and information by the use of appropriate technologies,	*Project planning and management*
Adapting to new situations	*Respect for diversity and multiculturalism*
Decision-making	*Environmental awareness*
Individual/Independent work	*Social, professional and ethical responsibility and sensitivity to gender issues*
Group/Team work	*Critical thinking*
Working in an international environment	*Development of free, creative and inductive thinking*
Working in an interdisciplinary environment	*……*
Introduction of innovative research	*(Other…….citizenship, spiritual freedom, social awareness, altruism etc.)*
	…….

-Research, analysis and synthesis of data and information using the necessary technologies
-Infrastructure design and management of related projects
-Respect for the natural environment

3. COURSE CONTENT

The syllabus of the course is as follows:
The object of Hydrometeorology-Hydroclimatology. Atmospheric and Terrestrial Phases of the Hydrological Cycle - Interrelationships of the two Phases. Characteristic spatial scales of Hydrology and Meteorology. Hydrological Cycle, Hydrographic Networks, River Basins and Introduction to Technical Hydrology.
Hydrometeorological information 'point rainfall' and its stochastic nature. Elements of probabilistic analysis of daily, seasonal and annual rainfall depths. Homogenization and maximization of point precipitation.
Spatial variability and surface distribution of point precipitation. Estimation of mean precipitation. Correlation of point to mean precipitation.
The maximum possible precipitation. Precipitable water and storm efficiency. Method of storm maximization and storm transport. Storm modelling method. Method of empirical relationships. Statistical analysis of extreme rainfall.
Water movement in watersheds. Characteristic quantities of the 'Rainfall-Runoff' transformation. Relationships between rainfall-hydrographs.
Precipitation-Runoff and Snow Runoff dummies in Agricultural, Semi-Mountainous and Mountainous Areas.
Hydrological Deficits in Agricultural Areas under Conditions of Changing Climate.
Water Balance Assessment. Emphasis on Agricultural (e.g. areas covered by Highly Cultivated Plants) and Forestry Areas. Case studies on typical agricultural areas of the Greek territory.
Elements of Technical Hydrology and Engineering Works in Agricultural Areas.
Extreme Runoff Values and Flood Peak Forecasting in Agricultural, Semi-Mountainous and Mountainous Areas.
Winter phenomena with emphasis on the Greek area and their control of agricultural and horticultural projects.
The hydrologic role of vegetation.

4. TEACHING METHODS--ASSESSMENT

MODES OF DELIVERY *Face-to-face, in-class lecturing, distance teaching and distance learning etc.*	Lecturing in the classroom and lectures/ tasks in the laboratory.

USE OF INFORMATION AND COMMUNICATION TECHNOLOGY *Use of ICT in teaching, Laboratory Education, Communication with students*	Use of slide presentation and blackboard. Communication with students via email. Learning process support by access to e-class asynchronous distance learning platform and Microsoft Teams Platform.

COURSE DESIGN

Description of teaching techniques, practices and methods:
Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, Internship, Art Workshop, Interactive teaching, Educational visits, projects, Essay writing, Artistic creativity, etc.

The study hours for each learning activity as well as the hours of self-directed study are given following the principles of the ECTS.

Activity/ Method	Semester workload
Lectures	39
Laboratory practice	36
Individual laboratory project (data processing and commenting)	10
Educational field trips	1
References and sources study	6
Personal study	7
Total of Course (25 hours of workload per ECTS)	***100***

STUDENT PERFORMANCE EVALUATION/ASSESSMENT METHODS *Detailed description of the evaluation procedures:* *Language of evaluation, assessment methods, formative or summative (conclusive), multiple choice tests, short- answer questions, open-ended questions, problem solving, written work, essay/report, oral exam, presentation, laboratory work.* *Specifically defined evaluation criteria are stated, as well as if and where they are accessible by the students.*	Written examination comprising - mainly - written work on processing and analysing hydro-meteorological and hydro-climatic data and solving related problems in agricultural/rural areas.

5. SUGGESTED BIBLIOGRAPHY:

Greek Textbooks

- Μπαλτάς, Ε., Μιμίκου, Μ. 2018. Τεχνική Υδρολογία. Εκδόσεις Παπασωτηρίου. Αθήνα.
- Παπαμιχαήλ, Δ.Μ. 2001. Τεχνική Υδρολογία Επιφανειακών Υδάτων. Εκδόσεις Γιαχούδη-Γιαπούλη.
- Τσίρος, Ι. 2019. Εφαρμοσμένη Υδρομετεωρολογία και Υδροκλιματολογία με Στοιχεία Υδρολογίας. Πανεπιστημιακές Σημειώσεις.

Textbooks in English

- Brutsaert, W. 2005. Hydrology: An Introduction. Cambridge University Press. 1st Edition.

(2nd Edition in 2023)

- Eagleson, P. 2005. Ecohydrology: Darwinian Expression of Vegetation Form and Function. Cambridge University Press.

6. TEACHERS:

-Theory: Ioannis Tsiros, Professor
-Laboratory: Ioannis Tsiros, Professor