COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Technology		
ACADEMIC UNIT	Department of Environmental Sciences		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	**AY406**	**SEMESTER**	**4th**
COURSE TITLE	**METEOROLOGY - CLIMATOLOGY**		
INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**		**CREDITS**
Teaching Hours	4		5
COURSE TYPE	General Background		
PREREQUISITE COURSES	None		
LANGUAGE OF INSTRUCTION and EXAMINATIONS	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/ENV_U_128/		

(2) LEARNING OUTCOMES

Learning outcomes

The aim of the course is to provide students with the opportunity to comprehend the basic concepts and applications of meteorology and climatology.

Upon successful completion of the course students will have acquired the necessary knowledge, skills and competence, and will be able to:

- Understand basic concepts, principles, theories and parameters related to the atmosphere and the phenomena that take place in it.
- Apply the acquired knowledge in solving qualitative and quantitative problems related to the subjects of the course.
- Apply the acquired knowledge in managing interdisciplinary nature issues (e.g. renewable energy sources, atmospheric pollution).
- Get engaged in future work related to Meteorology, Climatology and Physics of the Atmospheric Environment and deepen their knowledge on these fields.

General Competences

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Decision-making
- Working independently
- Respect for the natural environment
- Criticism and self-criticism
- Production of free, creative and inductive thinking

(3) SYLLABUS

- Introduction (content of Meteorology and Climatology sciences, historical development).
- Vertical structure of the atmosphere, changes in temperature, pressure and density with height.
- Radiation (solar radiation, infrared radiation, greenhouse effect, spatial and temporal variation of incident solar radiation, energy balance of the Earth – atmosphere system).
- Air temperature (changes in air temperature, daily temperature range, temperature inversions), land, ocean and sea temperature.
- Atmospheric pressure (atmospheric pressure changes, isobaric curves, pressure gradient, weather maps).
- Wind (forces that determine movements in the atmosphere, geostrophic wind, wind friction).
- Humidity in the atmosphere (parameters to describe atmospheric humidity, evaporation and evapotranspiration, clouds, small-scale condensations, precipitation).
- Air masses. Fronts. Barometric Systems (low and high).

- General atmospheric circulation, breezes, Etesian winds.
- Types and operation principles of meteorological instruments.
- Climate. Climatic classifications. Climatic indicators.
- Classification of Earth's climates according to Köppen.
- The climate framework of Greece.

(4) TEACHING and LEARNING METHODS – EVALUATION

DELIVERY	Face-to-face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	• Use of PowerPoint slides • View material in video • Communication with students via e-mail • Use of asynchronous distance learning (e-class)
TEACHING METHODS	

Activity	***Semester workload***
Lectures	39
Seminars	13
Study and analysis of bibliography	50
Essay writing	23
Course total (25 hours workload per credit)	**125**

STUDENT PERFORMANCE EVALUATION	Students' performance is evaluated in the Greek language. The final grade is determined by: • A written exam (at the end of the semester) that contributes 70% (or 100% in case of not delivering an assignment), to the final grade, applying one or more of the following evaluation methods: Multiple choice questions, short-answer questions, problem solving. • Elaboration and delivery of an optional assignment (during the semester) that contributes 30% to the final grade. **Final Grade = 70% Exam Grade + 30% Assignment Grade (if assignment is delivered) or** **Final Grade = 100% Exam Grade (if assignment is not delivered)**

(5) ATTACHED BIBLIOGRAPHY

- Aguado, E., Burt, J.E., Bartzokas, A. (Scientific Editor) (2019) *Weather and Climate. Introduction to Meteorology and Climatology,* (1st ed). Athens: ION Publishing Group. (in Greek)
- Ahrens, D., Henson, R. (2022) *Meteorology Today, An Introduction to Weather, Climate and the Environment,* (13th ed), Floka, E., Anagnostopoulou, X., Tolika, K., Hatzaki, M. (Scientific Eds). Thessaloniki: TZIOLA Publications. (in Greek)
- Flokas, A. (1997) *Meteorology and Climatology Courses.* Thessaloniki: ZITI Publications. (in Greek)
- Saxamanoglou, H.S., Bloutsos, A.A. (1998) *Physical Climatology.* Thessaloniki: ZITI Publications. (in Greek)
- Saxamanoglou, H.S., Makrogiannis, T.A. (1998) *General Meteorology.* Thessaloniki: ZITI Publications. (in Greek)