COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Technology		
ACADEMIC UNIT	Department of Environmental Sciences		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	**AY102**	**SEMESTER**	**1st**
COURSE TITLE	**PHYSICS for ENVIRONMENTAL SCIENCES**		
INDEPENDENT TEACHING ACTIVITIES	**WEEKLY TEACHING HOURS**		**CREDITS**
Teaching Hours	5		5
COURSE TYPE	General Background		
PREREQUISITE COURSES	None		
LANGUAGE OF INSTRUCTION and EXAMINATIONS	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)	https://eclass.uth.gr/courses/ENV_U_102/		

(2) LEARNING OUTCOMES

Learning outcomes

The aim of the course is to provide students with basic knowledge of Physics in areas related to the environment, placing emphasis on the atmospheric environment.

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

- Describe basic concepts of Physics and basic physical mechanisms related to environmental sciences and atmospheric Physics.
- Describe phenomena that occur in the Earth's atmosphere.
- Interpret and draw conclusions about issues related to the propagation of radiation and heat transfer
- Analyse thermodynamic processes observed in the environment.
- Exhibit profound knowledge of electromagnetic radiation applications and noise pollution issues.
- Propose management measures to solve environmental degradation issues.

General Competences

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

(3) SYLLABUS

- Scientific method, environmental sciences.
- Characteristics of the Earth and its movements.
- Structure, layers and regions of the atmosphere.
- The nature of light, reflection, refraction.
- Pressure, volume, temperature, heat, heat transfer, thermal expansion and contraction, phase changes, black body, laws of radiation, scattering of radiation in the atmosphere.
- Ideal gas law, first law of thermodynamics, gas laws, adiabatic process, second law of thermodynamics, heat and cool engine, Carnot engine, entropy.
- Vertical motions in the atmosphere, stability and instability of dry and moist air.
- Urban heat island.

- Electromagnetic radiation, ionizing and non-ionizing radiation, applications, environmental and biological effects.
- Structure of the atom, nucleus, mass deficit, binding energy, nuclear forces, radioactivity, half-life time, nuclear reactions.
- Sound, noise, propagation of sound, sound levels, acoustics of open and closed spaces, noise pollution.

(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
Laboratory practice	26
Study and analysis of bibliography	45
Essay writing	15
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 60% to the final grade, applying one or more of the following evaluation methods: Multiple choice questions, short-answer questions, problem solving.
- Students' participation in laboratory practice activities and the preparation and delivery of related assignments (during the semester) that contribute 40% to the final grade.

Final Grade = 60% Exam Grade + 40% Assignments Grade

(5) ATTACHED BIBLIOGRAPHY

- Halliday, D., Resnick, R., Walker, J. (2021) *Physics (Uniform)* (1st Ed) Styliaris, E., (General Scientific Editor). TYPOTHITO – Giorgos Dardanos Publications. (in Greek)
- Kassomenos, P. (2017) *Environmental Physics,* 1st Edition. Athens: Klidarithmos Publications. (in Greek)
- Young, H.D., Friedman, R. (2022) *University Physics with Modern Physics, Volume A: Mechanics, Waves, Thermodynamics* (4th Greek Ed). Athens: Papazissi Publications. (in Greek)
- Young, H.D., Friedman, R. (2022) *University Physics with Modern Physics, Volume B: Electromagnetism, Optics, Modern Physics* (4th Greek Ed). Athens: Papazissi Publications. (in Greek)