



COURSE OUTLINE

(1) GENERAL

SCHOOL	School of Technology		
ACADEMIC UNIT	Department of Environmental Sciences		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE	AD601	SEMESTER	6th
COURSE TITLE	DIDACTICS of NATURAL SCIENCES		
INDEPENDENT TEACHING ACTIVITIES	WEEKLY TEACHING HOURS		CREDITS
Teaching Hours		3	5
COURSE TYPE	Specialised general knowledge Curriculum for Pedagogical and Teaching Competence		
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_195		

(2) LEARNING OUTCOMES

Learning outcomes
<p>The term Natural Sciences refers to the sciences that study natural phenomena with the aim of describing, predicting, and understanding them. This definition explains the connection of Natural Sciences with Environmental Sciences, which, although autonomous, constitute the discipline that studies, on the one hand, the interdependence of communities within the environment in which they live and reproduce, and on the other hand, the interaction of humans with the natural environment, which creates environmental issues. By incorporating an environmental component into the teaching of natural sciences, the central goal of the course is to equip future educators with the necessary knowledge for a comprehensive understanding of issues related to both the natural and social worlds. This will be achieved through the comprehension of fundamental topics in the teaching of natural sciences and the development of a research-oriented mindset. Through this approach, the future teacher will be able to effectively use teaching tools and strategies specific to this scientific field, ensuring their effectiveness in the classroom.</p> <p>Upon successful completion of the course, students will be able to:</p> <ul style="list-style-type: none">• Understand the interdisciplinary and transdisciplinary approach in the practical application of Natural and Environmental Sciences in Education.• Be familiar with appropriate teaching methods within this scientific field.• Design and organize the teaching-learning process in Natural Sciences classes, both in Primary and Secondary Education, by formulating objectives and expected learning outcomes.• Properly use key teaching tools in the teaching of Natural Sciences within effective teaching models and strategies, enabling the transformation of scientific knowledge into classroom instruction while promoting active and collaborative learning.
General Competences
<ul style="list-style-type: none">• Search, analyse, and synthesize data and information, using necessary technologies• Decision-making• Autonomous work• Teamwork• Criticize and self-criticism• Promotion of free, creative, and inductive thinking• Design and management of teaching scenarios• Organizational skills

(3) SYLLABUS

- Concept and scope of Teaching.
- Purpose of teaching – Detailed programme – Classification of objectives.
- Relationship between Natural Sciences and Environmental Education.
- Teaching Natural Sciences and Environmental Education.
- Methods of teaching Natural Sciences and Environmental Science.
- The method of project work (project method) and experiential teaching scenario based on the project method.
- Constructivist working model in Natural Sciences and Environmental Education.
- Application of a teaching example based on the constructivist model.
- Problem – solving model.
- Exemplary teaching format based on the problem-solving model.
- Conceptualization and presentation of teaching forms as subordinate concepts of teaching methods.
- Conceptualization and presentation of learning strategies derived from teaching models.
- Lesson planning.
- Presentation of individual assignments by students to the group and feedback – discussion within the group.

(4) TEACHING and LEARNING METHODS – EVALUATION

DELIVERY METHOD	Face-to-Face, Experiential Teaching	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	<ul style="list-style-type: none"> • Use of PowerPoint slides • View material in video presentation • Visiting and utilizing material from websites • Communication with students via e-mail • Use of asynchronous distance learning (e-class) 	
TEACHING METHODS	Activity	Semester workload
	Lectures / Exemplary Lessons	35
	Study and analysis of bibliography	35
	Essay writing and presentation	55
	Course total (25 hours workload per credit unit)	125
STUDENT PERFORMANCE EVALUATION	<p>Students' performance is evaluated in the Greek language. The final grade is determined by:</p> <ul style="list-style-type: none"> • An end-of-semester written exam that contributes 70% to the final grade, applying one or more of the following evaluation methods: multiple-choice questions, short-answer questions, problem-solving. • Elaboration of an individual written assignment, in the 2nd half of the semester, which contributes 30% to the final grade. The assignment may be presented by the students in class. <p>Final Grade = 70% Exam Grade + 30% Assignment Grade</p>	

(5) ATTACHED BIBLIOGRAPHY

- Chalkia, K. (2011). *Teaching Natural Sciences*. Athens: Patakis Publications. (in Greek)
- Kapsalis, A., Nema, E. (2015). *Contemporary Teaching*. Thessaloniki: Kyriakidis Bros Publications S.A. (in Greek)
- Kokotas, P.V. (2005). *Didactics of Natural Sciences (Vol. A)*. Athens: Gregory publications. (in Greek)
- Mandrikas, A. (2015). *Environmental Science: Ethics and Education*. Athens: Kalendis Editions (in Greek)