

COURSE OUTLINE

1. GENERAL

SCOOOL	ENVIRONMENT AND AGRICULTURAL ENGINEERING		
DEPARTMENT	NATURAL RESOURCES MANAGEMENT AND AGRICULTURAL ENGINEERING		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	54	SEMESTER	6 th
COURSE TITLE	APPLIED THERMODYNAMICS		
INDEPENDENT TEACHING ACTIVITIES 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		WEEKLY TEACHING HOURS	CREDITS
LECTURES		3	3
LABORATORY PRACTICES		2	2
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE general background, special background, specialised general knowledge, skills development	SPECIAL BACKGROUND		
PREREQUISITE COURSES:	-PHYSICS, CHEMISTRY, MATHEMATICS I, II, III		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	-		
COURSE WEBSITE (URL)	ELECTRONIC NOTES AND PRESENTATIONS OF THE COURSE ARE AVAILABLE FOR THE STUDENTS OF THE SEMESTER AT THE ADDRESS, https://oeclass.aua.gr/eclass		

2. LEARNING OUTCOMES

<p><i>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.</i></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> • <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> • <i>Guidelines for writing Learning Outcomes</i>
<p>This is a basic introductory course on thermodynamics.</p> <p>The objectives of the course are to</p> <ul style="list-style-type: none"> - Present the basic principles of thermodynamics. - Analyse examples of real-world engineering applications so that the students understand how thermodynamics and heat transfer are related to practical engineering applications. <p>Students are guided through explanations of concepts, the use of practical examples and a series of laboratory exercises to acquire knowledge and develop the necessary skills necessary in subsequent courses on various scientific topics.</p>
<p>General Competences</p> <p>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</p>

the course aim?	
Search for, analysis and synthesis of data and Project planning and management information, with the use of the necessary technology Respect for difference and multiculturalism Adapting to new situations Respect for the natural environment	Search for, analysis and synthesis of data and Project planning and management information, with the use of the necessary technology Respect for difference and multiculturalism Adapting to new situations Respect for the natural environment
<ul style="list-style-type: none"> - Searching, analysing and synthesising data and information, using the necessary technologies - Autonomous work - Project planning and management - Teamwork - Decision-making - Promoting free, creative and deductive thinking - Design and management of related units. 	

3. SYLLABUS

Theory:

Introductory concepts, definitions, units of measurement. First law of thermodynamics in closed and open systems. Energy analysis of open systems. Physical properties of materials. Ideal and real gases. Gas mixtures. Psychrometry. Second law of thermodynamics. Reversible and irreversible processes. Entropy and consequences of the 2nd law. Thermodynamics of irreversible processes. Transfer of heat, temperature, thermometers, amount of heat, calorimetry. Gas power cycles. Vapor and combined power cycles. Refrigeration cycles. Thermodynamic properties relations. Gas mixtures.

Laboratory work that includes:

Series of problems solved in the classroom.

4. TEACHING and LEARNING METHODS - EVALUATION

DELIVERY Face-to-face, Distance learning, etc.	Face – to -face	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY Use of ICT in teaching, laboratory education, Communication with students	Use of ICT in teaching and communication with students	
TEACHING METHODS The manner and methods of teaching are described in detail. 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. The student's study hours for each learning activity are given as well as the hours of non- directed study	<i>Activities</i>	<i>Semester workload</i>
	Lectures	75
	Laboratories	50
	<i>Course total</i>	<i>125</i>

according to the principles of the ECTS	
<p style="text-align: center;">STUDENT PERFORMANCE EVALUATION</p> <p>Description of the evaluation procedure</p> <p>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 Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</p>	<p>I. Written examination in the theory of the course, including:</p> <ul style="list-style-type: none"> - Multiple-choice questions on the semester's syllabus. - A solution to an exercise if applicable. <p>II. Written examination in the laboratory part of the course, including:</p> <ul style="list-style-type: none"> - Development, judgment and multiple-choice questions on the semester syllabus.

5. ATTACHED BIBLIOGRAPHY

- E-NOTES
- Thermodynamics an engineering approach, Yunus Cengel, Michale Boles
- FUNDAMENTALS OF ENGINEERING THERMODYNAMICS, M. Moran, H. Shapiro