a) General			
School	ENGINEERING		
Academic unit	MECHANICAL ENGINEERING		
Level of studies	Undergraduate		
Course code	MM108E01	*Semester*	8
Course title	**Thermodynamics II**		

Independent teaching activities	*Weekly teaching hours*	*ECTS*
Lectures	4	4
Laboratory exercises	0	

Course type	Knowledge deepening
Course category	Compulsory Elective for Direction 1
Prerequisite courses	-
Language of instruction and examinations	Greek
Is the course offered to Erasmus students	No
Course website (url)	https://eclass.uniwa.gr/courses/MECH157

b) Learning outcomes and general competences

b1. Learning outcomes

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

- Apply thermodynamic laws to solve energy problems
- Evaluate the efficiency of energy systems
- Analyze and calculates how to improve energy systems
- Calculate various thermodynamic and physicochemical properties of mixtures
- Know the methods of separating two-dimensional mixtures

b2. General competences

- Search for, analysis and synthesis of data and information with the use of the necessary technology
- Decision-making
- Working independently
- Team work

c) Syllabus

Exergy analysis, Irreversible work, Principle of reducing and destroying the exergy of a system, Exergy rate balance, Balance of thermodynamic systems, Gibbs and Helmholtz Functions, Thermodynamic properties of systems of variable composition (ideal behavior), Equilibrium of ideal behavior of ideal solutions, Raoult Law, Thermodynamic properties of systems of variable composition (non-ideal behavior), Fugacity - fugacity coefficient, Activity factor, Fractional distillation

d) Teaching and learning methods - Evaluation

Delivery	Face-to-face	
Use of information and communications technology	- Commercial/free/open source software - Multimedia applications - eclass - Open courses	
Teaching methods	*Activity*	*Semester workload*
	Lectures	26

	Tutorials	13
	Laboratory exercises	0
	Computational exercises	13
	Individual work	78
	Course total	130
Student performance evaluation	Written final examination	

e) Suggested bibliography

1. Cengel & Boles. (2011). Θερμοδυναμική για Μηχανικούς (Μετάφραση). Εκδόσεις Τζιόλας.
2. Παπαϊωάννου, Α. (2007). Θερμοδυναμική (Βασικές αρχές και νόμοι-Καθαρές ουσίες). Τόμοι 1, 2 & 3. Εκδόσεις Κοράλι.
3. Smith, J.M. and Van Ness, H. C. (1990). Εισαγωγή στη θερμοδυναμική. Τόμος Β. Εκδόσεις Τζιόλας.
4. Reid, R.C., Prausnitz, J.M. and Poling, B.E. (1987). The Properties of Gases and Liquids. NY. McGraw Hill Co.