COURSE OUTLINE

1. GENERAL

SCHOOL			
DEPARTMENT	DEPARTMENT OF PHYSICS UNDEGRADUATE STUDY PROGRAM: PHYSICS		
LEVEL OF STUDIES	ISCED level 6 – Bachelor's or equivalent level		
COURSE CODE	Y604-2023	**SEMESTER**	6th Semester
COURSE TITLE	Statistical Physics		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
	4	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Background
PREREQUISITES	None
TEACHING & EXAMINATION LANGUAGE:	Greek
COURSE OFFERED TO ERASMUS STUDENTS:	YES
COURSE URL:	https://eclass.emt.duth.gr/courses/PHYSICS223/

2. LEARNING OUTCOMES

Learning Outcomes Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.
The course covers the subject of Statistical Physics. The basic principles of Statistical Physics will be introduced, along with how they connect microscopic to macroscopic properties. The fundamental distributions and the methods for selecting them will be discussed. The phenomenon of paramagnetism will be examined. The concept of an ideal gas and blackbody radiation will be analyzed. Upon successful completion of the course, the student will be able to: Understand the Basic Principles of Statistical Physics and how it links the microscopic structure of a system to its macroscopic properties. Choose the appropriate statistical distribution (microcanonical, canonical, or grand canonical) depending on the conditions governing a given system. Recognize the similarity of conditions in systems of different scales and thus generalize this knowledge and experience to other systems.

General Skills	
Name the desirable general skills upon successful completion of the module	
Search, analysis and synthesis of data and information, ICT Use,Adaptation to new situations, Decision making, Autonomous work, Teamwork, Working in an international environment, Working in an interdisciplinary environment, Production of new research ideas	Project design and management Equity and Inclusion Respect for the natural environment Sustainability Demonstration of social, professional and moral responsibility and sensitivity to gender issues Critical thinking Promoting free, creative and inductive reasoning
Search, analysis and synthesis of data and information, ICT Use Adaptation to new situations Decision making Autonomous work Teamwork Production of new research ideas	

3. COURSE CONTENT

The course covers topics related to the continuation of Thermodynamics and the explanation of macroscopic measurements based on theories originating from the microscopic world. It includes topics such as the determination of entropy, temperature, free energy, the partition function, the exact specification of microstates, probability distributions, and statistical ensembles. Additionally, it covers topics in quantum statistical physics, such as Fermi-Dirac, Bose-Einstein, and Maxwell-Boltzmann statistics. Finally, key theorems like the equipartition of energy are discussed, along with theories such as those of classical ideal gases, the Ising model, and paramagnetism.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	Use of ICT in Communication with students
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	

Activity	Workload/semester
Lectures	52
Bibliographic research & analysis	85
Writing project	30
Total	**167**

STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Student evaluation languages** Greek English **Method (Formative or Concluding)** Summative **Student evaluation methods** **Rate**

5. Suggested Bibliography

Ότι υπάρχει και στον Εύδοξο

Eudoxus

Στατιστική Φυσική & Θερμοδυναμική, Βέργαδος Ι., ΡεμεδιάκηςΙ., Τριανταφυλλόπουλος Η.
ΣΤΑΤΙΣΤΙΚΗ ΦΥΣΙΚΗ, F.MANDL
Στατιστική φυσική, Ευαγγέλου Σ.