COURSE OUTLINE

(1) GENERAL

SCHOOL	NATURAL SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF PHYSICS		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	**71**	**SEMESTER**	**7**
COURSE TITLE	STATISTICAL PHYSICS I		

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**
	4	7
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		

COURSE TYPE *general background, special background, specialised general knowledge, skills development*	General background
PREREQUISITE COURSES:	
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes
COURSE WEBSITE (URL)	http://ecourse.uoi.gr/course/view.php?id=483

(2) LEARNING OUTCOMES

Learning outcomes

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.

Consult Appendix A

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

The objective of this course is to connect the empirical science of Thermodynamics with the fundamental science of Statistical Physics, to introduce the basic principles of the latter and to apply them in a variety of physical systems. At the end of the course, the student should be able to:

1. Recall the basic methods and quantities of classical thermodynamics and the limitations of this empirical theory.
2. Explain how the Statistical Thermodynamics determines the same macroscopic properties of the system but based on its microscopic structure.
3. Employ the appropriate probability distribution functions to study a system with a large number of particles and predict its behaviour.
4. Apply the methods of Statistical Physics in simple, classic systems with constant or variable number of particles.

General Competences

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 the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
……
Others…
…….

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

(3) SYLLABUS

Overview of classical thermodynamics. Statistical thermodynamics of an isolated system. Thermal systems with constant number of molecules. Classical statistical mechanics. Thermal systems with variable number of molecules. Statistics of identical particles.

(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 the course web page on http://ecourse.uoi.gr to post notes, exercise sheets and solutions Use of electronic mail to communicate with the 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 according to the principles of the ECTS*	

Activity	***Semester workload***
Lectures	39
Problem Solving	13
Study of Bibliography	120
Exams	3
Course total	***175***

STUDENT PERFORMANCE EVALUATION *Description of the evaluation procedure* *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,*	End-of-semester written exams (3 hours) during which the students are asked to solve problems related to the material taught at the course

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.*	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

1. "Statistical Physics", F. Mandl, G. Pnevmatikos Publications, 2013, Athens.
2. "Statistical Mechanics", S. Evangelou, Papazisis Publications, 2012.
3. "Statistical Physics", I.D. Vergados and E.S. Triantafyllopoulos , Symeon Publications, 1991, Athens.