

SUBJECT TEACHING GUIDE

G54 - Statistical Physics

Double Degree in Physics and Mathematics Degree in Physics

Academic year 2017-2018

1. IDENTIFYING DATA					
Degree	Double Degree in Physics and Mathematics Degree in Physics			Type and Year	Compulsory. Year 4 Compulsory. Year 3
Faculty	Faculty of Sciences				
Discipline	Third Year Subjects Subject Area: Physics, Statistics and Thermodynamics Central Module				
Course unit title and code	G54 - Statistical Physics				
Number of ECTS credits allocated	6	Term	Semester based (1)		
Web	http://moodle.unican.es/moodle/				
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. FISICA APLICADA				
Name of lecturer	JOSE RAMON SOLANA QUIROS				
E-mail	ramon.solana@unican.es				
Office	Facultad de Ciencias. Planta: + 2. DESPACHO DE PROFESORES (2042)				
Other lecturers	JUAN MANUEL LOPEZ MARTIN JULIO LARGO MAESO				

3.1 LEARNING OUTCOMES

- To know to choose the appropriate statistical ensemble to study the thermodynamic properties of a system depending on its characteristics.

- To Know to choose the appropriate treatment, classical or quantical, depending on the characteristics of the particles of the system and the state parameters.

4. OBJECTIVES

- To know how to relate de microscopic properties of a system with the macroscopic thermodynamic properties .
- To know to to develop models of the real thermodynamic systems by means of the formulation of reasonable hypothesis about them.
- To understand the basic properties of the Maxwell-Bolstzmann, Fermi-Dirac, and Bose-Einstein distributions and the kind of systems to which each of the can be applied.
- To know how to apply the methods of Thermodynamics in combination with those of Statistical Physics to different thermodynamic systems.

6. COURSE ORGANIZATION

CONTENTS

1	Foundations - Foundations of Statistical Mechanics - Ensembles and phase space in Statistical Mechanics - Distributions in classical Statistical Mechanics - Connection between Statistical Mechanics and Thermodynamics - Quantum statistics
2	Applications 1 - Classical ideal gas - Quantum ideal gases - Real gases
3	Applications 2 - Crystalline solid - Electron gas in a metal - Magnetic systems - Radiation - Stellar systems

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Description Solution of exercises by the student.	Written exam	No	Yes	100,00
Written examination	Written exam	Yes	Yes	0,00
TOTAL				100,00
Observations				
<p>In each bloc the evaluation will consist of a series of tests, each of them consisting in the solution by the student of one or two exercises within the time of the lesson.</p> <p>As an indication there will be six tests, approximately one every one or two lessons.</p> <p>The minimum score of each test is 0.</p> <p>If the average score of the continuous evaluation is lower than 5.0, it may be approved by means of a final examination. The final examination will have a maximum duration of four hours and will consist in 4-6 exercises.</p> <p>If a student does not approve the matter in February, might approve it in September by means of an examination with the same characteristics than the above-mentioned final examination.</p> <p>In all the test it is allowed the use of books and notes.</p>				
Observations for part-time students				
Continuous evaluation 2 partial examinations each of them consisting in three exercises with a maximum duration of two hours.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

- 1) Apuntes del profesor
- 2) Pathria, R. K. "Statistical Mechanics". Ed. Pergamon Press. Oxford, 1977.