

NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

Course Title		STATISTICAL MECHANICS	
Course Code	PH656	No. of Credits	4
Department	Physics	Faculty	Dr. R. Sankaranarayanan
Pre-requisites Course Code	PH653 – Classical Mechanics PH655 – Quantum Mechanics		
Course Coordinator(s) (if, applicable)	Dr. A. Chandra Bose		
Course Teacher(s) / Tutor(s) E-mail	sankar@nitt.edu	Telephone No.	0431-250-3609
Course Type	<input checked="" type="checkbox"/> Core course		<input checked="" type="checkbox"/> Elective
COURSE OVERVIEW			
<p>Any system that interacts with surroundings reaches thermal equilibrium asymptotically. If a system is imagined to be made up of very large number of particles, then the bulk or measurable state of the system in equilibrium can be systematically associated with the state of constituent particles in statistical sense. In this frame work, only three kinds of statistics (Maxwell-Boltzmann, Bose-Einstein, Fermi-Dirac) are sufficient to uncover the intriguing connection between macroscopic and microscopic behaviour of a system.</p>			
COURSE OBJECTIVES			
To learn the connection between bulk (macroscopic) state and microscopic state of a system of large number of particles at thermal equilibrium.			
COURSE OUTCOMES			
Students will be able to understand various properties of matter and radiation in thermal equilibrium through appropriate statistics. Students will be prepared to understand solid state physics and technology.			
COURSE TEACHING AND LEARNING ACTIVITIES			
S. No.	Week	Topic	Mode of Delivery
1	1 – 3	Thermodynamics	Chalk & Talk
	4 – 6	Theory of Ensembles	Chalk & Talk
	7 – 9	Maxwell-Boltzmann Statistics	Chalk & Talk
	10 – 12	Bose-Einstein Statistics	Chalk & Talk
	13 – 15	Fermi-Dirac Statistics	Chalk & Talk

COURSE ASSESSMENT METHODS

S. No.	Mode of Assessment	Week / Date	Duration	% Weightage
1	I Cycle Test (Unit I & II)	6 th week	1 Hour	20 %
2	II Cycle Test (Unit III & IV)	12 th week	1 Hour	20 %
3	Assignment / Quiz	4 th and 8 th week	-	10 %
4	Semester Examination	16 th week	3 Hours	50 %

Retest (Unit I – IV) with the weightage 20% will be conducted *only* for those who are absent in I / II Cycle Test with prior intimation on genuine grounds.

ESSENTIAL READINGS

Text Books

1. M.W. Zeemansky and R.H. Dittman, Heat and Thermodynamics, 8th edition, Mc-Graw Hill (2011).
2. K. Haug, Statistical Mechanics, 2nd edition, Wiley India (2010).
3. F.W. Sears and G.L. Salinger, Thermodynamics, Kinetic Theory and Statistical Thermodynamics, 3rd edition, Narosa Publishing House (1998).

Reference Books

1. Enrico Fermi, Thermodynamics, Dover (1956).
2. R.K. Pathria and Paul D. Beale, Statistical Mechanics, 3rd edition, Academic Press (2011).
3. F. Reif, Fundamentals of Statistical and Thermal Physics, International Students edition, Tata McGraw-Hill (1988).
4. S.J. Blundell and K.M. Blundell, Concepts in Thermal Physics, Oxford University Press (2006).
5. L.D. Landau and E.M. Lifshitz, Statistical Physics – Part I, 3rd edition, Elsevier (2010).

COURSE EXIT SURVEY

1. Feedback from students.
2. Identifying scope for improvement through self assessment.

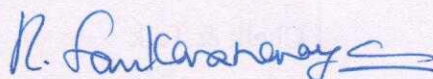
COURSE POLICY (including plagiarism, academic honesty, attendance etc.)

1. 75% attendance is mandatory to write semester examination.
2. Interactive learning in lecture session.
3. Students should solve problems in tutorial session.

ADDITIONAL COURSE INFORMATION

Interaction with the staff is highly encouraged inside / outside the class room.

FOR SENATE'S CONSIDERATION


Course Faculty _____

CC-Chairperson _____

HOD _____

