

BHARATHIAR UNIVERSITY, COIMBATORE-641 046

B.Sc. PHYSICS WITH NANO TECHNOLOGY

SCHEME OF EXAMINATIONS (CBCS PATTERN)

(For the students admitted during the academic year 2010-2011 and onwards)

Part	Study Components	Course Title	Ins. hrs / week	Exam				Credit
				Dur.Hr	CIA	Marks	Total Marks	
Semester I								
I	Language-I		6	3	25	75	100	4
II	English-I		6	3	25	75	100	4
III	Core I – Heat and Thermo Dynamics		3	3	25	75	100	4
III	Core II – Mechanics, Properties of Matter and Sound		3	3	25	75	100	4
III	Major Practical I		3	-	-	-	-	-
III	Allied A - Mathematical Paper I * (or) Chemistry Theory I **		7	3	25	75	100	4
			4	3	20	55	75	3
III	Allied Practical**		3	-	-	-	-	-
IV	Environmental Studies #		2	3	-	50	50	2
Semester II								
I	Language-II		6	3	25	75	100	4
II	English-II		6	3	25	75	100	4
III	Core III – Electricity and Magnetism		6	3	25	75	100	4
III	Major Practical I		3	3	40	60	100	4
III	Allied A - Mathematical Paper II * (or) Chemistry Theory II **		7	3	25	75	100	4
			4	3	20	55	75	3
III	Allied Practical**		3	3	20	30	50	2
IV	Value Education - Human Rights #		2	3	-	50	50	2
Semester III								
I	Language-III		6	3	25	75	100	4
II	English-III		6	3	25	75	100	4
III	Core IV – Optics		4	3	25	75	100	4
III	Major Practical II		2	-	-	-	-	-
III	Allied B - Mathematical Paper I * (or) Chemistry Theory I **		7	3	25	75	100	4
			4	3	20	55	75	3
III	Allied Practical**		3	-	-	-	-	-
IV	Skill Based Subject - Instrumentation I		3	3	20	55	75	3
IV	Tamil @ / Advanced Tamil# (OR) Non-major elective - I (Yoga for Human Excellence)# / Women's Rights #		2	3	50	50	50	2

Semester IV							
I	Language-IV	6	3	25	75	100	4
II	English-IV	6	3	25	75	100	4
III	Core V – Atomic Physics and Nuclear Physics	4	3	25	75	100	4
III	Major Practical II	2	3	40	60	100	4
III	Allied A - Mathematical Paper II * (or) Chemistry Theory II **	7	3	25	75	100	4
		4	3	20	55	75	3
III	Allied Practical**	3	3	20	30	50	2
IV	Skill based Subject - Instrumentation II	3	3	20	55	75	3
IV	Tamil @ /Advanced Tamil # (OR) Non-major elective -II (General Awareness #)	2	3	50		50	2
Semester V							
III	Core VI – Mathematical Physics	5	3	25	75	100	4
III	Core VII – Applied Electronics	5	3	25	75	100	4
III	Core VIII – Solid State Physics	4	3	25	75	100	4
III	Core IX – Principles of Digital Electronics & Micro Processors	3	3	25	75	100	4
III	Major Practical III - Electronics Alone	2	-	-	-	-	-
III	Major Practical IV - Digital and Micro Processor	2	-	-	-	-	-
III	Elective -I	4	3	20	55	75	3
	Major Practical V - C and C++	2	-	-	-	-	-
IV	Skill based Subject - Instrumentation III	3	3	20	55	75	3
Semester VI							
III	Core X – Quantum Mechanics and Relativity	4	3	25	75	100	4
III	Core XI - Principles of Programming concepts and C Programming	4	3	20	55	75	3
	Core XII - Object Oriented Programming with C++	4	3	20	55	75	3
III	Major Practical III - Electronics Alone	2	3	30	45	75	3
	Major Practical IV - Digital and Micro Processor	2	3	30	45	75	3
	Major Practical V - C and C++	2	3	20	30	50	2
III	Elective -II	4	3	20	55	75	3
III	Elective -III	5	3	20	55	75	3
IV	Skill based Subject –Instrumentation Practical	3	3	40	60	100	3
V	Extension Activities @	-	-	50	-	50	2
	Total					3500	140

- * For subjects without practical ** For subjects with Practical
@ No University Examinations. Only Continuous Internal Assessment (CIA)
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List of Elective papers (Colleges can choose any one of the paper as electives)		
Elective – I	A	Nano Mechanics
Elective – II	A	Fundamentals of Nano Materials and its Characterization
Elective - III	A	Nanoscale Materials & Devices

Note : The Syllabus for the above papers (except Core Paper I – Heat and Thermodynamics & Core Practical I) be the same as prescribed for the academic year 2008-09. The syllabus for the Core Paper I – Heat and Thermodynamics & Core Practical I are furnished below:

SEMESTER – I
CORE PAPER I - HEAT AND THERMO DYNAMICS

No. of Credit Hours : 3 per week

Subject Description : This paper presents the principle of heat and Thermo dynamics.

Goal: To enable the students in order to learn the basic principles and concepts of Heat and Thermodynamics

Objectives

The aims is to provide the students

- To understand the principles of calorimetry
- understand the basic principle and laws of thermodynamics
- understand the concepts of entropy

UNIT I

(9 hrs)

Definitions – Newton’s law of cooling – specific heat of a liquid calendar and Barne’s continuous flow method – two specific heats of a gas – specific heat of a gas by Joly’s differential steam calorimeter – Regnault’s method – Dulong and Petit’s law – variation of specific heat ad atomic heat with temperature.

UNIT II

(9 hrs)

Transmission of heat : Conduction – Co-efficient of the thermal conductivity – Cylindrical flow of heat – Determination of thermal conductivity of rubber and Lee’s disc method for bad conductors. Conduction – Radiation – Black body – Wein’s Law - Raleigh – Jean’s Law – Stefan’s law – Experimental Determination of Stefan’s constant – Mathematical derivation of Stefan’s law

UNIT III

(9 hrs)

Kinetic theory of gases: Maxwell’s law of distribution of molecular velocities – Experimental verification – equilibrium speed distribution of velocities. Mean free path – transport phenomena – diffusion – viscosity and thermal conduction of gases – Vander walls equation – relation between Vander Wall’s constant and critical constants.

UNIT IV

(9 hrs)

Laws of Thermodynamics: First law of thermodynamics – Isothermal and Adiabatic process – gas equation during an adiabatic process – Work done an adiabatic expansion of gas – Determination of γ by Clement and Desorme’s method – second law of thermodynamics – Carnot’s engine- Working efficiency – Carnot’s refrigerator – Carnot’s Theorem.

UNIT V

(9 hrs)

Concept of entropy: Entropy Change in entropy in a reversible process and irreversible process – temperature entropy diagram – Entropy of a perfect gas – increase of entropy in any irreversible process – Thermo dynamics functions – Maxwell’s thermodynamics relations and applications –Porous plug experiment – Joule Thomson effect – expression for temperature of inversion - Claussius and Clapeyron equation.

Books for Study

1. Thermal Physics, R. Murugesan, I Edi, 2002
2. Heat & Thermodynamics, Brijlal & N. Subramaniam
3. Heat – M. Narayanamurthi and N. Nagaratnam

Reference Books

1. Heat and Thermodynamics – Zemansky and R.H. Dcltanann
2. Heat and Thermodynamics – D.S. Mathur, S. Chand & Co, Edi 2002.
3. Heat and Thermodynamics – Agarwal, Singhal, Sathyaprakash
4. Thermal Physics – H.C. Saxena and Agarwal

CORE PRACTICAL I (EXAMINATION AT THE END OF SECOND SEMESTER)

Credit Hours : 3 hours per week

ANY TWELVE EXPERIMENTS ONLY

1. Compound Pendulum.
2. Comparison of Viscosities – Capillary Flow Method
3. Young's Modulus – Non- Uniform bending – Pin and Microscope
4. Young's Modulus – Uniform bending – Optic lever
5. Rigidity modulus – Static Torsion – Scale and Telescope
6. Sonometer – Frequency of A.C.
7. Spectrometer – Refractive index of Solid Prism
8. Resonance Column – Velocity of Sound
9. Moment of magnet – Tan C Position
10. Characteristics of a Junction Diode
11. Spectrometer – (i.d) Curve
12. Air Wedge – Thickness of Wire
13. Field along the axis of a coil – Moment of a Magnet
14. Potentiometer – Specific Resistance of a wire
15. Potentiometer – Low range Ammeter Calibration
16. Young's Modulus Cantilever Depression – Pin & Microscope
17. Young's Modulus – Cantilever – Dynamic Method
18. Viscosity by Capillary flow method
19. Melde's Strings – Frequency of Vibrator.