BHARATHIAR UNIVERSITY,COIMBATORE-641 046

B.Sc. PHYSICS WITH MATERIAL SCIENCE

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 Dur.Hr	CIA	Marks	Total Marks	Credit
	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)		7	3	25	75	100	4
	Chemistry Theory I **		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)		7	3	25	75	100	4
	Chemistry Theory II **		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)		7	3	25	75	100	4
	Chemistry Theory I **		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	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)	7	3	25	75	100	4
	Chemistry Theory II **	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	20	55	75	3
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++	3	-	-	-	-	-
IV	Skill based Subject - Instrumentation III	3	3	25	75	100	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 (Practical)	3	3	30	45	75	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	Basics of Material Science
Elective – II	Materials and its Behaviours
Elective - III	Materials for Special Applications

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.

Note : 1. The minimum number of experiments to be completed for Core Practical I & II be modified as "Any Twelve" instead of Any Fourteen.

2. The minimum number of experiments to be completed for Practical III,IV & V be modified as "Any Fourteen" instead of Any Sixteen.