DWARAKA DOSS GOVERDHAN DOSS VAISHNAV COLLEGE (Linguistic Minority Institution) [AUTONOMOUS] Accredited at 'A' Grade by NAAC

B. Sc. PHYSICS SYLLABUS (Effective from 2015-2016 batch)



"Gokulbagh" 833, Periyar E.V.R. Salai, Arumbakkam, Chennai – 600106 For updated information on Rules and Regulations, please see the University of Madras Website, College calendar and consult your teacher

UNIVERSITY OF MADRAS

BACHELOR DEGREE COURSES: UNDER THE FACULTY OF SCIENCE (B.Sc.)

B.SC PHYSICS CHOICE BASED CREDIT SYSTEM

REGULATIONS

1. ELIGIBILITY FOR ADMISSION:

Candidates for admission to the first year of the Degree of Bachelor of Science courses shall be required to have passed the Higher Secondary Examinations (with Mathematics, Physics and Chemistry) conducted by the Government of Tamil Nadu or an Examination accepted as equivalent thereof by the Syndicate of the University of Madras. Provided that candidates for admission into the specific main subject of study shall be Possess such other qualifying conditions as may be prescribed by the University as given in the APPENDIX-A.

2. ELIGIBILITY FOR THE AWARD OF DEGREE:

A candidate shall be eligible for the award of the Degree only if he /she has undergone the prescribed course of study in a College affiliated to the University for a period of not less than three academic years, passed the examinations all the Six-Semesters prescribed earning **140 Credits** (in Parts-I, II, III, IV & V).

3. DURATION:

- a) Each academic year shall be divided into two semesters. The first academic year shall comprise the first and second semesters, the second academic year the third and fourth semesters and the third academic year the fifth and sixth semester respectively.
- b) The odd semesters shall consist of the period from June to November of each year and the even semesters from December to April of each year. There shall be not less than 90 working days for each semester.

4. COURSE OF STUDY:

The main Subject of Study for Bachelor Degree Courses shall consist of the following and shall be in accordance with **APPENDIX-B**

PART – I TAMIL / OTHER LANGUAGES

PART – II ENGLISH

PART – III CORE SUBJECTS / ALLIED SUBJECTS / ELECTIVES

PART - IV

- 1.(a) Those who have not studied Tamil up to XII Std. and taken a Non-Tamil Language under Part-I shall take Tamil comprising of two course (level will be at 6^{th} Standard).
 - (b) Those who have studies Tamil up to XII Std. and taken a Non-Tamil Language under Part-I shall take Advanced Tamil comprising of two courses.
 - (c) Others who do not come under a + b can choose non-major elective comprising of two courses.
- 2. SKILL BASED SUBJECTS (ELECTIVE) (SOFT SKILLS)
- 3. ENVIRONMENTAL STUDIES
- 4. VALUE EDUCATION

PART – V EXTENSION ACTIVITIES

5. EXTENTION ACTIVITIES:

A candidate shall be awarded a maximum of 1 Credits for Complusory Extension Service.

All the Students shall have to enrol for NSS /NCC/ NSO (Sports & Games) Rotract/ Youth Red cross or any other service organizations in the college and shall have to put in Complusory minimum attendance of 40 hours which shall be duly certified by the Principal of the college before 31st March in a year. If a student LACKS 40 HOURS ATTENDANCE in the First year, he/she shall have to compensate the same during the subsequent years.

Students those who complete minimum attendance of 40 hours in One year will get HALF A CREDIT and those who complete the attendance of 80 or more hours in Two Years will ONE CREDIT.

Literacy and population Education Field Work shall be compulsory components in the above extension service activities.

6. SCHEME OF EXAMINATION:

Scheme of Examination shall be given in APPENDIX - C Model Scheme

Course Component	Hou	LTE dite	EX8 m	Max. Marks

Name of the course		Ext.	Int.	Total
		mark	mark	Total
PART-I Language		60	40	100
PART-II English		60	40	100
PART-III Core subject		60	40	100
Core Subject		60	40	100
Allied Subject		60	40	100
 PART – IV 1.(a) Those who have not studied Tamil up to XII Std. and taken a Non-Tamil Language under Part-I shall take Tamil comprising of two course (level will be at 6th Standard). (b) Those who have studies Tamil up to XII Std. and taken a Non-Tamil Language under Part-I shall take Advanced Tamil comprising of two courses. (c) Others who do not come under a + b can choose non-major elective comprising of two courses. 				
2*Skill based subjects(Elective) – (Soft Skill)				

7. REQUIREMENTS FOR PROCEEDING TO SUBSEQUENT SEMESTER:

- i. Candidates shall register their names for the First Semester Examination after the admission in UG Courses.
- ii. Candidates shall be permitted to proceed from the First Semester up to Final Semester irrespective of their failure in any of the Semester Examination subject to the condition that the candidates should register for all the arrear subject of earlier semesters along the current (subsequent) Semester Subjects.
- iii. Candidates shall be eligible to go to subsequent semester, only if they earn, sufficient attendance as prescribed there for by the Syndicate from time to time.

8. PASSING MINIMUM:

A candidate shall be declared to have passed:

- a) There shall be no Passing Minimum for Internal.
- b) For External Examination, Passing Minimum shall be of 40% (Forty Percentage) of the maximum marks prescribed for the paper for each Paper/Practical/Project and Viva-voce.
- c) In the aggregate (External + Internal) the passing minimum shall be of 40%.
- d) He/She shall be declared to have passed the whole examination, if he/she passes in all the papers and practicals wherever prescribed / as per the scheme of examinations by earning 140 CREDITS in Parts-I, II, III, IV & V. He/she shall also fulfill the extension activities prescribed earning a minimum of 1 Credit to qualify for the Degree.

9. CLASSIFICATION OF SUCCESSFUL CANDIDATES:

PART- I TAMIL / OTHER LANGUAGES:

TAMIL/OTHER LANGUAGES: Successful candidates passing the Exami-nations for the Language and securing the marks (1) 60 percent and above and (ii) 50 percent and above but below 60 percent in the aggregate shall be declared to have passed the examination in the FIRST and SECOND class, respectively. All other successful candidates shall be declared to have passed the examination in the THIRD Class.

PART – II ENGLISH:

ENGLISH: Successful candidates passing the examinations for English and securing the marks (i) 60 percent and above and (ii) 50 percent and above but below 60 percent in the aggregate shall be declared to have passed the examination in the FIRST and SECOND Class, respectively. All other successful candidates shall be declared to have passed the examination in the THIRD class.

PART - III consisting of CORE SUBJECTS, ALLIED SUBJECTS, ELECTIVES:

Successful candidates passing the examinations for Core Courses together and securing the marks (i) 60 percent and above (ii) 50 percent and above but below 60 percent in the aggregate of the marks prescribed for the Core courses together shall be declared to have passed the examination in the FIRST and SECOND Class respectively. All other successful candidates shall be declared to have passed the examinations in the Third Class.

PART - IV (consisting of sub items 1 (a), (b) & (c), 2, 3 and 4) as furnished in the Regulations 4 Part-IV supra.

PART – V EXTENTION ACTIVITIES:

Successful Candidate earning of 1 credit SHALL NOT BE taken into consideration for Classification/Ranking/ Distinction.

10. RANKING:

Candidates who pass all the examinations prescribed for the course in the FIRST APPEARANCE ITSELF ALONE are eligible for Ranking/ Distinction.

Provided in the case of Candidates who pass all the examinations prescribed for the Course with a break in the First Appearance due to the reasons as furnished in the Regulations. 7 (iii) supra are only eligible for classification.

APPENDIX – A

ADDITIONAL ELIGIBILITY CONDITIONS FOR

ADMISSION TO THE FOLLOWING COURSE:

CANDIDATES FOR ADMISSION TO THE FOLLOWING COURSE SHALL HAVE PASSED THE QUALIFYING EXAMINATION WITH THE SUBJECTS NOTED AGAINST:

B.Sc PHYSICS : PHYSICS and MATHEMATICS

APPENDIX - B

COURSE OF STUDY

The Course of Study shall comprise the study of Part-I to Part-V Courses; .

PART - I TAMIL/OTHER LANGUAGES comprise the study of:

Tamil or any one of the following Modern (Indian or Foreign) or classical languages at the optional candidate, according to the syllabi and text-books prescribed from time to time.

- (i) Modern (Indian) Telugu, Kannada, Malayalam, Urdu & Hindi.
- (ii) Foreign Chinese, French, German, Italian, Japanese, & Russia
- (iii) Classical Sanskrit, Arabic & Persian.

AND

PART – II ENGLISH according to the syllabi and text-books prescribed from time to time.

PART – III CORE COURSES Comprise the study of (A) Main Subjects; (B) Allied Subjects; (C) Electives;

(A) MAIN SUBJECTS:

B.Sc DEGREE COURSE IN PHYSICS

(B) ALLIED SUBJECTS:

Each candidate shall choose the Allied subjects prescribed in the Scheme of Examinations.

(C) ELECTIVES:

PART – IV

- 1.(a) Those who have not studied Tamil up to XII Std. and taken a Non-Tamil Language under Part-I shall take Tamil comprising of two course (level will be at 6th Standard).
 - (b) Those who have studies Tamil up to XII Std. and taken a Non-Tamil Language under Part-I shall take Advanced Tamil comprising of two courses.

- (c) Others who do not come under a + b can choose non-major elective comprising of two courses.
- 2. SKILL BASED SUBJECTS (ELECTIVE) (SOFT SKILLS)
- 3. ENVIRONMENTAL STUDIES
- 4 VALUE EDUCATION
- PART V EXTENSION ACTIVITIES

SYLLABUS FOR B.Sc. PHYSICS DEGREE COURSE

(According to Choice Based Credit System)

[Effective from the academic year 2015-2016 batch]

The Regulations and syllabi for the B.Sc. Physics Degree course for the I to VI semesters as per the format given by the Tamilnadu State Council for Higher Education [TANSCHE], Chennai, under Choice Based Credit System with the minimum of 120 credits for the UG Degree Courses to be offered in the affiliated colleges, is given in Annexure – I.

Accordingly Choice Based Credit System is offered for B.Sc. Physics Degree Course.

The distribution of available 30 hours per week among various papers is given in Annexure -I.

The Question Paper pattern is shown in Annexure - II

The Internal Evaluation Pattern is shown in Annexure – III.

The department takes utmost care to maintain high academic standards. The Syllabi of the University of Madras, various autonomous colleges and the model curricula of UGC were referred to and all possible updations and upgradations have been effected.

All papers are unitized to 5 units as per UGC Norms.

The proposed new syllabus is submitted herewith.

NOTE : EXTRA credits for Online courses completed

B.Sc. Physics Students can register for various **Online courses** of their choice from **SWAYAM**, **NPTEL**, **IIRS- ISRO**, **SAKSHAT**, **or other online** courses from our **MHRD and MIT EDx**, **Couresera.** Those who **successfully complete** these courses will be **awarded EXTRA CREDITS**, along with their regular credits earned .

ANNEXURE – I

Distribution of Hours, Marks and Credits for B.Sc Physics Degree Course

SEMESTER 1

	Course	Course Inst F		Evom	Μ	Max. Marks			
S.No.	Components	Subjects	Subjects Hrs		Hrs	Ext. Marks	Int. Marks	Total	
1	PART I	Language Paper I	6	3	3	60	40	100	
2	PART II	English Paper I	6	3	3	60	40	100	
3	PART III Core Courses	Core Paper I Mechanics and Properties of Matter	5	5	3	60	40	100	
		Core Practical I	3	Practical e	ctical examination at the end of Semester				
4	Allied Subject I	Allied Mathematics 1	6	5	3	60	40	100	
5	Part IV Non-Major Elective/	Basic Tamil	2	2	3	60	40	100	
6	Soft Skill I		2	2	3	60	40	100	
	Total	6	30			360	240	600	

SEMESTER 2

	Course	Course ComponentsSubjectsInst. HrsCreditsExample Hrs		Evom	Max. Marks			
S.No.	Components			Credits	Hrs	Ext. Marks	Int. Marks	Total
1	PART I	Language Paper II	6	3	3	60	40	100
2	PART II	English Paper II	6	3	3	60	40	100
3	PART III Core Courses	Core Paper II Thermal Physics and Acoustics	5	5	3	60	40	100
		Core Practical I	3	4	3	60	40	100
4	Allied Subject II	Allied Mathematics II	6	5	3	60	40	100
5	Part IV Non-Major Elective/	Basic Tamil	2	2	3	60	40	100
6	Soft Skill II		2	2	3	60	40	100
	Total	6	30			420	280	700

	Course		Inst		Evom	Μ	ax. Mark	S
S.No.	Components	Subjects	Hrs	Credits	Hrs	Ext. Marks	Int. Marks	Total
1	PART I	Language Paper III	6	3	3	60	40	100
2	PART II	English Paper III	6	3	3	60 40		100
3	PART III Core Courses	Core Paper III Optics	5	5	3	60	40	100
		Core Practical II	3		Practical examination at the end of Semester IV			
4	Allied Subject I	Allied Chemsitry I		5	3	60	40	100
5		Allied Chemistry Practicals		Practical examination at the end of Even Semester				
6	EVS		2	Examination at the end of Even Semester				
7	Soft Skill III		2	2	3	60	40	100
	Total			18		300	200	500

SEMESTER 4

	Course	Course mponentsSubjectsInst. HrsCreditsExam Hrs		Evom	Max. Marks			
S.No.	Components			Hrs	Ext. Marks	Int. Marks	Total	
1	PART I	Language Paper IV	6	3	3	60	40	100
2	PART II	English Paper IV	6	3	3	60	40	100
3	PART III Core Courses	Core Paper IV Atomic Physics	5	5	3	60	40	100
		Core Practical II	3	4	3	60	40	100
4	Allied Subject II	Allied Chemistry II		5	3	60	40	100
5		Allied chemistry Practicals		5	3	60	40	100
6	EVS		2	2	3	60	40	100
7	Soft Skill IV		2	2	3	60	40	100
	Total			29		480	320	800

SEMESTER 5

S No	Course		Inst		Evon	Μ	ax. Mark	5
5.110	Course Components	Subjects	Hrs	Credits	Exam Hrs	Ext. Marks	Int. Marks	Total
1		Core Paper V Electricity and Electromagnetism	5	5	3	60	40	100
2		Core Paper VI Mathematical methods in Physics	5	5	3	60	40	100
3	Core Courses	Core Paper VII Solid State Physics	4	5	3	60	40	100
4		Core Paper VIII Basic Electronics	4	5	3	60	40	100
5		Elective I Applied Electronics	4	5	3	60	40	100
6		Core Practical III	3	Dractical	avomino	ion at the	and of Sa	mastar
7		Core Practical IV	3	Fractical	CXamma	VI	end of Se	mester
8		Core Practical V	2	VI VI				
9		Value Education		2			100	
	Total		30	27				600

SEMESTER 6

						N	Max. Marks		
S.No.	Course Components	Subjects Inst. Hrs		Credits	Exam Hrs	Ext. Mark s	Int. Marks	Total	
1		Core Paper IX Relativity and Quantum Mechanics	6	5	3	60	40	100	
2	PART III Core	Core Paper X Nuclear and Particle Physics	6	5	3	60	40	100	
3	Courses	Elective II Digital Electronics	5	5	3	60	40	100	
4		Elective III Microprocessor Fundamentals	5	5	3	60	40	100	
6		Core Practical III	3	4	3	60	40	100	
7		Core Practical IV	3	4	3	60	40	100	
8		Core Practical V	2	4	3	60	40	100	
	Total		30	32		480	220	700	

ALLIED PHYSICS

			Treat		Enam	Max. Marks			
S.No.	Semester	Subjects Hrs Credits		Credits	Exam Hrs	Ext. Marks	Int. Marks	Total	
1	Odd Semester	Allied Physics I	5	5	3	60	40	100	
2		Allied Practicals	3	Practical Examination at the end of Even semester					
3	Even Semester	Allied Physics II	5	5	3	60	40	100	
4		Allied Physics Practicals	3	4	3	60	40	100	

No. of Credits earned from Department of Physics by B.Sc Physics Students

Somostor	Pa	per		Marks				
Semester	Theory	Practical	Theory	Practical	Total	Creatts		
Ι	1	-	100	-	100	5		
II	1	1	100	100	200	9		
III	1	-	100	-	100	5		
IV	1	1	100	100	200	9		
V	5	-	500	-	500	25		
VI	4	3	400	300	700	32		
IV	EVS		75	25	100	2		
Total			1575	525	2100	91		

No. of Credits earned from Department of Physics by B.Sc Maths /Chemistry students:

Somostor	P	aper		Marks				
Semester	Theory	Practical	Theory	Practical	Total	Creans		
Odd Semester	1	-	100	-	100	5		
Even Semester	1	1	100	100	200	9		
Total	2	1	200	100	300	14		

No. of Credits earned from Department of Physics by B.Com. students from 2019-20

Semester	Paper	Marks	Credits
Ι	Non major Elective	100	2
II	Non Major Elective	100	2
Total	2	200	4

ANNEXURE – II Question Paper Pattern for B.Sc Physics Degree Course based on CBCS Pattern (except non-major elective)

THEORY

Maximum Ext. Marks: 100 **Duration: 3 hours**

PART A (50 words)		
To answer 10 questions		
out of 12 questions (at least two questions from each unit)	10x2mark	ts=20 marks
PART B (200 words)		
To answer 5 questions		
out of 7 question (at least one question from each unit)	5X7 mark	ts=35 marks
PART C (500 words)		
To answer 3 questions		
out of 5 question (at least one question from each unit)	3X15mar	ks=45 marks
	Total	100 marks

Question paper pattern for non-major elective THEORY

	Maximum Ext. Marks: 100 Duration: 3 hours
PART A	
To answer 10 questions	
out of 12 questions (at least two questions from each unit) PART B	10x2marks=20 marks
To answer 5 questions	
out of 7 question (at least one question from each unit) PART C	5X7 marks=35 marks
To answer 2 questions	
out of 5 question (at least one question from each unit)	3X15marks=45 marks Total 100 marks

PRACTICALS

Maximum Ext. Marks: 60 **Duration: 3 hours**

The external examiner will prepare a question paper on the spot with the help of the Question Bank supplied by the controller's office.

ANNEXURE – III

Pattern of Internal Evaluation for B.Sc Physics Degree Course based on CBCS Pattern

THEORY

Maximum Int. Marks: 40

Best Two tests out of 3	15 marks	
Attendance	5 marks	
Assignment/Seminar	5 marks	
Class Activity		
-	PRACTICAL	
		Maximum Int. Marks: 40
Attendance	5 marks	
Practical Tests best 2 out of 3	30 marks	
Record	5 marks	

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DEPARTMENT OF PHYSICS

B.Sc DEGREE COURSE IN PHYSICS

Syllabus

Semester – I

Core Paper - 1

MECHANICS AND PROPERITIES OF MATTER (Effective from 2015-2016 batch)

No. of crédits: 5

No. of hours allotted: 5/Week

Unit 1: Impulse and Impact

Impulse – impact – Laws of impact – direct impact and oblique impact between two smooth spheres – loss of kinetic energy – conservation of linear momentum — motion of two interacting bodies – reduced mass- reduction of two body problem into single body problem.

Gravitation

Moment of inertia – Parallel axes theorem – moment of inertia of hollow sphere, solid cone - Compound pendulum – theory – equivalent simple pendulum – reversibility of centre of oscillation and suspension –determination of g and k– Newton's law of gravitation(statement) - Determination of G by Cavendish method - Kepler's law (statement).

Unit 2: Statics, hydrostatics

Centre of parallel forces – Centre of mass – Centre of gravity – Centre of gravity of uniform triangular lamina – Centre of gravity of uniform parallelogram lamina, solid and hollow hemisphere – Centre of pressure – vertical rectangular lamina – vertical triangular lamina – condition for equilibrium of a floating body

Hydrodynamics

Streamline and turbulent flow - equation of continuity of flow -Euler's equation of unidirectional flow - Torricelli's theorem - Bernoulli's theorem - applications - Venturimeter - Pitot's tube - atomizer pump - Bunsen burner

Unit 3: Elasticity

Hooke's law – stress – strain - modulus of elasticity - elastic constants – relation between elastic moduli - Poisson's ratio - expressions for Poisson's ratio in terms of elastic constants – work done in stretching a wire - work done in twisting a wire –

twisting couple on a cylinder- rigidity modulus - moment of inertia by static torsion method - by torsional pendulum method

Unit 4: Bending of beams

Cantilever – expression for bending moment – expression for depression – cantilever oscillations – expression for time period – experiment to find Young's modulus – Non uniform bending – experiment to determine Young's modulus by Koenig's method – Uniform bending – expression for elevation – experiment to determine Young's modulus using pin and microscope by non uniform method – experiment to determine Young's modulus by optic lever method – I-form girders

Unit 5: Fluid dynamics

Surface tension - definition – excess of pressure over curved surface – spherical drop – cylindrical drop – spherical bubble – cylindrical bubble - determination of surface tension by drop weight method – experiment to determine interfacial surface tension – surfactants – variation of surface tension with temperature – Jaegar's method.

Viscosity - definition – Coefficient of viscosity of liquid – critical velocity – Rate of flow of liquid in a capillary tube – Poiseuille's formula –experimental determination by capillary flow method – variation of viscosity of a liquid with temperature – Viscosity of gases – Rankines method – Application.

Books for Study

- 1. Mechanics Part I and II by M.Narayanamoorthy, National Publishing Company.
- 2. Mechanics by D.S.Mathur, S.Chand & Co., 2nd Edition (2001).
- 3. Statistics, Hydrostatics and Hydrodynamics by M.Narayanamoorthy &

N.Nagarathinam, National Publishing Company, Chennai (1989).

4. Properties of Matter by Brij Lal and N.Subramaniam, S. Chand & Co., New Delhi (1994).

5. Elements of Properties of Matter by D.S.Mathur, S. Chand & Co., New Delhi (2001).

Books for Reference

- 1. General Properties of Matter by C.J. Smith, Orient Longman Publishers (1960).
- 2. Fundamentals of Physics by D. Halliday, R.Rensick and J. Walker, 6th edition, Wiley, New York (2001).

3. Mechanics and General Properties of Matter by P.K. Chakrabarthy, Books and Allied (P) Ltd (2001).

4. Fundamentals of General Properties of Matter by H.R.Gulati, S. Chand & Co., New Delhi (1982).

Semester – II

Core Paper - 2

THERMAL PHYSICS AND ACOUSTICS (Effective from 2015-2016 batch)

No. of credits : 5

No. of hours allotted : 5/Week

Unit 1: Thermometry and Calorimetry

Platinum resistance thermometer – Calendar and Griffith's bridge – thermistor – specific heat capacity – specific heat capacity of solids – Dulong and Petit's law – specific heat capacity of liquid – method of mixtures –half time correction – specific heat capacity of gases – Meyers relation.

Low temperature physics

Joule-Kelvin effect – porous plug experiment - significance of Boyle temperature - temperature of inversion – liquefaction of gases – Linde's method of liquefying air.

Unit 2: Thermodynamics

Thermodynamic equilibrium – zeroth law of thermodynamics – first law of thermodynamics – Reversible and irreversible processes – second law of thermodynamics-Heat engine – Carnot's engine – Carnot's theorem – Internal combustion engines – petrol and diesel engines – thermodynamic scale of temperature(No derivation) - Entropy – entropy and available energy – temperature – entropy diagram for Carnot's cycle - III Law of thermodynamics – Nernst's heat theorem.

Unit 3: Conduction and Radiation

Prevost's theory of heat exchange – Kirchoff's Law - thermal conductivity – rectilinear flow of heat – thermal conductivity of a good conductor – Forbe's method – thermal conductivity of a bad conductor – Lee's disc method – radiation – blackbody radiation – Wien's law – Stefan's law – Rayleigh Jeans Law –Planck's law (no derivation), Newton's law of cooling from Stefan's law – Solar constant – Pyroheliometer – temperature of sun and other stellar objects.

Unit 4: Waves and Oscillations

Simple harmonic motion - combination of two SHMs in a straight line – at right angles – Lissajous's figures - uses – free, damped, forced oscillations and resonance – examples and application of resonance – laws of transverse vibration – determination of frequency of a tuning fork using sonometer – determination of a.c. frequency using sonometer – steel wire – brass wire.

Unit 5: Ultrasonics and Architectural acoustics

Ultrasonics – production – piezo electric crystal method – magnetostriction method – diffraction of ultrasonics waves – ultrasonic interferometer – ultrasonic grating applications. Acoustics of buildings – reverberation – absorption coefficient – Sabine's formula – acoustics aspects of halls and auditoriums – intensity and loudness of sound – intensity level – decibel – noise pollution.

Books for study

- 1. Heat and Thermodynamics by D.S.Mathur, Sulthan Chand & Sons, New Delhi (1993).
- 2. Heat and Thermodynamics by Brijlal and N. Subramanyam, S.Chand & Co, New Delhi (2000).
- 3. Heat by Narayanamoorthy and KrishnaRao, Triveni Publishers, Madras (1969).
- 4. Text book of Sound by V.R.Khanna and R.S.Bedi, 1st edition, Kedharnaath Publish & Co, Meerut (1998).
- 5. Waves and Oscillations by Brijlal and N. Subramanyam, Vikas Publishing house, New Delhi (2001).
- 6. Text book of Sound by Ghosh, S.Chand & Co, New Delhi (1996).

Books for Reference

- 1. Heat and Thermodynamics by Zemansky, McGraw Hill Book Co. Inc., New York.
- 2. Fundamentals of Physics by Resnick Halliday and Walker, 6th edition,, John Willey and Sons, Asia Pvt.Ltd., Singapore.
- 3. Fundamentals of Thermodynamics by Carroll M.Leonard, Prentice-Hall of India (P) Ltd., New Delhi (1965).
- Heat and Thermodynamics by J.B.Rajam and C.L.Arora, 8th edition, S.Chand & Co. Ltd., New Delhi (1976).
- 5. Principles of Thermodynamics by Jin Sheng Hieh, 1st edition, McGraw Hill Kogakusha Ltd., Tokyo (1975).
- 6. Thermodynamics by Warren Giedt, 1st edition, Van Nostrand Reinhold Company, New York (1971).

CORE PRACTICAL – I (Practical Examination at the end of the Second semester) (Any fifteen experiments)

No. of credits: 4 External: 60 marks. Record: 10 marks Practical Exam: 50 marks

- 1. Young's modulus Non-uniform bending Pin & microscope
- 2. Young's modulus Uniform bending Optic lever scale and telescope
- 3. Rigidity modulus Torsional pendulum (without identical masses)
- 4. Rigidity modulus and moment of inertia Torsional pendulum (with identical masses)
- 5. Surface tension and interfacial surface tension drop weight method
- 6. Coefficient of viscosity of liquid using graduated burette (radius of capillary tube by Mercury pellet method)
- 7. Comparison of viscosity of liquid by burette method Hare's apparatus given
- 8. Sonometer Verification of laws and frequency of tuning fork
- 9. Sonometer Relative density of a solid and liquid
- 10. Specific heat capacity of a liquid Newton's law of cooling
- 11. Specific heat capacity of liquid Method of mixtures (Half-time correction)
- 12. Focal length, Power, R and refractive index of a long focus convex lens
- 13. Focal length, Power, R and refractive index of a concave lens
- 14. Spectrometer refractive index of a liquid hollow prism
- 15. P.O. Box Temperature coefficient of resistance of a coil
- Note: Use of Digital balance is permitted

The following procedure is to be followed for internal marks (40 marks)

Attendance: 5 marks Practical test – best 2 out of 3: 30 marks Record: 5 marks