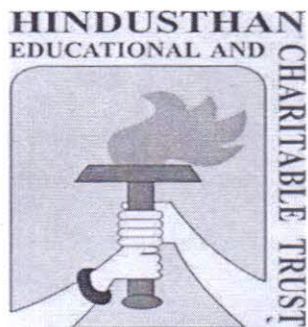


**LEARNING OUTCOMES–BASED CURRICULUM
FRAMEWORK (LOCF)**

in the

**UNDERGRADUATE PROGRAMME BACHELOR OF
SCIENCE (B.Sc., PHYSICS)**

**FOR THE STUDENTS ADMITTED FROM THE
ACADEMIC YEAR 2021 - 2022 AND ONWARDS**



HICAS

HINDUSTHAN COLLEGE OF ARTS & SCIENCE (AUTONOMOUS)

(Affiliated to Bharathiar University and Accredited by NAAC)

**COIMBATORE-641028
TAMILNADU, INDIA.**

Phone: 0422-4440555

Website: www.hicas.ac.in

PREAMBLE

Learning Outcome Based Curriculum Framework for Undergraduate education in Bachelor of Science in Physics. At the end of this programme, the students can acquire a comprehensive knowledge and sound understanding of fundamentals of Physics, including practical, analytical and mathematical skills to solve problems, to evaluate information, to use computers productively, to communicate with society effectively and learn independently. In addition, the students can obtain a job efficiently in diverse fields such as Science and Engineering, Education, Banking, Public Services, Business etc.

VISION

To provide excellent education to the students to face global challenges and to inculcate the latest trends in technological advancement. To cater the needs of the environmental and ethical values in the mind of students to become good citizens and entrepreneurs.

MISSION

The Mission of the college is to pursue a philosophy of perpetual acquisition of knowledge. The important policy is to provide value-based education and to bring out the hidden potentials in students that equip them to approach life with optimism.

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

Under Graduates of Physics program will,

PEO 1: Produce graduates who excel in the competencies and values required for leadership to serve a rapidly evolving global community

PEO 2: Endow the students with creative and analytical skills, this will equip them to become entrepreneurs

PEO 3: Serve the society with scientific advancement and to actively take part in building knowledge-based society

PEO 4: Enter into higher studies leading to post-graduate and research degrees

PEO 5: Engross in life-long learning to keep themselves abreast of new developments and to face global challenges

PROGRAMME OUTCOME (PO)

B.Sc (Physics) Students will be able to

PO1: DISCIPLINARY KNOWLEDGE: Understand the basic concepts and significance of various physical phenomena

PO2: PROBLEM SOLVING AND ANALYSING: Apply the knowledge of Physical Science to solve real life problems

PO3: ENVIRONMENT SUSTAINABILITY AND ETHICS: Develop an independent and self-disciplined specialized learning in tune with the changing socio-technological scenario

PO4: MODERN TOOL USAGE: Develop creative thinking and innovative tools

PO5: CO-OPERATIVE TEAM WORK & COMMUNICATIVE SKILLS: Communicate effectively in order to acquire employability/ self – employment

PO6: SELF DIRECTED / LIFE LONG LEARNING: Transform ideas into action i.e. lab to land

PO7: ENHANCING RESEARCH CULTURE: Get motivated to pursue higher education and research activities in Physics to find professional level employment

PROGRAMME SPECIFIC OUTCOME (PSO)

PSO1: Understand the core areas of physics, including mechanics, thermodynamics, quantum mechanics and electronics at a level compatible with graduate programs.

PSO2: Be able to analyse and interpret quantitative results, both in the core areas of physics and interdisciplinary areas.

PSO3: Be able to use contemporary experimental apparatus and analysis tools to acquire, analyse and interpret scientific data.

PSO4: Communicate explicitly and exchange ideas with regard to the impacts of various components of Physics on environment and society.

PSO5: Identify and access the diverse applications of Physics using mathematical concepts enriching towards career opportunities.

**HINDUSTHAN COLLEGE OF ARTS & SCIENCE (AUTONOMOUS),
COIMBATORE-641028**

SCHEME OF EXAMINATIONS - CBCS & LOCF PATTERN

(For the Students admitted from the Academic year 2021-2022 and Onwards)

UG PROGRAMME

Programme: B.Sc.,

Branch: Physics

Part	Course Code	Course Type	Course Title	Credit points	Lecture Hours/ Week		Exam Duration (hours)	MAX. MARKS		
					Theory	Practical		I.E.	E.E	Total
Semester – I										
I	21LAT01/ 21LAH01/ 21LAM01/ 21LAF01	MIL	Tamil-I/ Hindi-I/ Malayalam – I/ French-I	4	6		3	30	70	100
II	21ENG01	AECC	English – I	4	6		3	30	70	100
III	21PHU01	DSC	Core-I: Mechanics, Properties of Matter and Acoustics	4	6		3	30	70	100
III	21PHU02	DSC	Core-II: Electricity and Magnetism	4	6		3	30	70	100
III	21PHU03	GE	ALLIED-I : Mathematics – I	4	5		3	30	70	100
IV	21PHUE01	AEE	Open Elective – I	2	3		3	100	-	100
IV	21GSU01	AECC	Environmental Studies	1	2		2	50	-	50
IV	21PHUV01	SEC	VAC-I/Life Skills-I @/ Communicative English	1*	2		2	50	-	50**
IV	-	SEC	SDR- Student Development Report	Assessment will be in the Fifth Semester						
V	-	AECC	Extension Activities NSS/NCC/SPORTS/YRC/SIS/SA	Assessment will be in the Fourth Semester						
Total				23	36			300	350	650
Semester – II										
I	21LAT02/ 21LAH02/ 21LAM02/ 21LAF02	MIL	Tamil-II/ Hindi-II/ Malayalam-II/ French-II	4	6		3	30	70	100
II	21ENG02	AECC	English – II	4	6		3	30	70	100
III	21PHU04	DSC	Core-III: Heat and Thermodynamics	4	4		3	30	70	100
III	21PHU05	DSC	Core-IV: Energy Physics	4	4		3	30	70	100
III	21PHU06	DSC	Core-V: Semiconductor Devices	4	4		3	30	70	100
III	21PHU07	GE	ALLIED-II: Mathematics – II	4	5		3	30	70	100

III	21PHU08	DSC	Core-VI: PRACTICAL – I: General Physics– I	2		3	3	40	60	100
III	21PHU09	SEC	Internship / Industrial Visit / Mini Project	1	-	-		100		100
IV	21PHUV02	SEC	VAC-II/Life Skills-II @ / Language	1*	2		2	50	-	50**
IV	21PHUJ01	SEC	Aptitude / Placement Training	Grade *	2		2	50		50**
Total				27	33	3		320	480	800
Semester – III										
III	21PHU10	DSC	Core-VII: Optics	5	6		3	30	70	100
III	21PHU11	DSC	Core-VIII: Nuclear Physics	5	6		3	30	70	100
III	21PHU12	DSC	Core-IX: Practical – II: General Physics – II	2		3	3	40	60	100
III	21PHU13	GE	ALLIED-III: Chemistry – I	4	5		3	30	70	100
III	21PHU14A 21PHU14B	DSE	ELECTIVES I/ DSE– I	4	4		3	30	70	100
	21PHU15A 21PHU15B	DSE	ELECTIVES II/ DSE – II	3	4		3	30	70	100
IV	21PHUE02	AEE	Open Elective-II	2	3		3	100		100
IV	21GSU02	AECC	Human Rights	1	2		2	50		50
IV	21PHUJ02	SEC	Aptitude / Placement Training	Grade *	2		2	50		50**
IV	21PHUJ03	SEC	Online Course	-	1			-	-	C/NC [‡]
Total				26	33	3		340	410	750
Semester - IV										
III	21PHU16	DSC	Core-X: Material Science	5	5		3	30	70	100
III	21PHU17	DSC	Core-XI: Theoretical Physics	5	5		3	30	70	100
III	21PHU18	DSC	Core-XII: Microprocessor	4	4		3	30	70	100
III	21PHU19	DSC	Core-XIII: Practical – III: General Electronics - I	2		3	3	40	60	100
III	21PHU20	GE	ALLIED-IV: Chemistry – II	4	5		3	30	70	100
III	21PHU21	GE	ALLIED – V: Practical I: Chemistry	2		3	3	40	60	100
III	21PHU22A 21PHU22B	DSE	ELECTIVES III / DSE– III	3	4		3	30	70	100
	21PHU23	SEC	Internship / Institutional Training / Mini-Project	1	-		-	100	-	100

IV	21PHUV03	ACC	VAC-III	1*	2		2	50	-	50**
IV	21PHUJ04	SEC	Aptitude / Placement Training	Grade *	2		2	50		50**
IV	21PHUJ05	SEC	Online Course	-	1		-	-	-	C/NC [‡]
IV	21GSU03	AECC	Internet Security	1	2		2	50	-	50
V	21GSU04	AECC	Extension Activities NSS/NCC/SPORTS/YRC/SIS/SA#	2	-		-		-	C/NC [‡]
Total				29	30	6		380	470	850
Semester - V										
III	21PHU24	DSC	Core-XIV: Quantum Mechanics and Relativity	5	6		3	30	70	100
III	21PHU25	DSC	Core-XV: Atomic Physics and Spectroscopy	5	6		3	30	70	100
III	21PHU26	DSC	Core-XVI: C-Programming	4	6		3	30	70	100
III	21PHU27	DSC	Core-XVII: Practical – IV: General Physics - III	2		3	3	40	60	100
III	21PHU28	DSC	Core-XVIII: Practical – V: C-Programming	2		3	3	40	60	100
III	21PHU29A 21PHU29B	DSE	ELECTIVES IV / DSE – IV	3	3		3	30	70	100
IV	21PHUE03	AEE	Open Elective-III	2	3		3	100	-	100
IV	21GSU05	AECC	General Awareness	1	1		2	50	-	50
IV	21GSU06	AECC	Law of Ethics	1	-		2	50	-	50
IV	21PHUV04	ACC	VAC-IV	1*	2		2	50	-	50**
IV	21PHUJ06	SEC	Aptitude / Placement Training	Grade *	2		2	50	-	50**
IV	21PHUJ07	SEC	Online Course	-	1		-	-	-	C/NC [‡]
IV	21PHUJ08	SEC	SDR- Student Development Report	2*	-	-	-	-	-	-
Total				25	30	6		400	400	800
Semester – VI										
III	21PHU30A 21PHU30B	DSE	ELECTIVES V/ DSE– V	4	6		3	30	70	100
III	21PHU31A 21PHU31B	DSE	ELECTIVES VI/ DSE - VI	4	6		3	30	70	100
III	21PHU32	SEC	Project Work /Student Research / Paper	4	4			40	60	100
III	21PHU33	DSC	Core IX Self-Study Course	3	-	-	3	30	70	100
Total				15	16			130	270	400

- *denotes Extra credits which are not added with total credits.
- **denotes Extra marks which are not added with total marks.
- VAC-Value Added Course(Extra Credit Courses)
- *Grades depends on the marks obtained
- [#]C-Completed/ NC- Not Completed

Range of Marks	Equivalent remarks
80 and above	Exemplary
70-79	Very good
60-69	Good
50-59	Fair
40-49	Satisfactory
Below 40	Not Satisfactory=Not completed

- Part IV& V not included in total marks and CGPA calculation.
- I.E-Internal Exam
- E.E-External Exam
- J-Job Oriented Course
- E-Open Elective Papers

PASSING MINIMUM

- Passing Minimum for UG 40% and for PG 50 %
- For UG : 35 % (25 marks) in EE and 40 % in Total Marks
For PG 50 % (30 marks) in EE and 50 % in Total Marks

ABSTRACT FOR SCHEME OF EXAMINATION

(For the candidates admitted during the academic year 2021 - 2022 and onwards)

Part	Course	Papers	Credit	Total Credits	Marks	Total Marks
Part I	Languages/ (MIL)	2	4	8	100	200
Part II	English/AECC-I	2	4	8	100	200
Part III	Core /DSC	18	2/4/5	68	100	1800
	Self-Study Course /DSC	1	3	3	100	100
	Allied /GE	5	2/4	18	100	500
	Electives/DSE	6	2/3/4	21	100	600
	Project SEC	1	4	4	100	100
Part IV	Open Electives /AEE	3	2	6	100	300
	AECC –EVS/ HR/IS/GA/LE	5	1	5	50	250
	Value Added Course / ACC	2	1	2*	50	100**
	Skill Based/ Placement/Aptitude SEC	4	Grade	Grade	50	200**
	Online courses / SEC	3	C/NC	C/NC	-	-
	Life Skills / VAC / SEC	2	1	2*	50	100**
	Internship/Institutional Training/Mini-Project (Summer Courses #)	2	1	2	100	200
	SDR- Student Development Report	1	2	2*	-	-
Part V	Extension Activities NSS / NCC/Sports/YRC / SIS / SA –AECC	1	C/NC	2	-	-
	Total			146 (6 Extra Credits)		4250+ (400**)

List of Elective Papers/ DSE (Can choose any one of the paper as electives)		
	Course Code	Title
Electives/ DSE-I	21PHU14A	Basic Electronics
	21PHU14B	Digital Electronics
Electives/ DSE-II	21PHU15A	Waves And Oscillations
	21PHU15B	Thermal Physics
Electives/ DSE-III	21PHU22A	Mathematical Physics
	21PHU22B	Astrophysics
Electives/ DSE-IV	21PHU29A	Introduction of Nano technology
	21PHU29B	Bio Physics
Electives/ DSE-V	21PHU30A	Solid state Physics
	21PHU30B	Introduction To Classical Mechanics
Electives/ DSE-VI	21PHU31A	Computational Physics
	21PHU31B	Experimental Physics I

Syllabus Coordinator

(Dr. V. SENTHIL)

Academic Council – Member Secretary

Dr. M. MAHALAKSHMI

Co-ordinator
Academic Audit Cell
Hindusthan College of Arts & Science
Coimbatore-641 028.

BOS-Chairman/Chairperson

(Dr. V. BALAPRAKASH)

PRINCIPAL
PRINCIPAL

Hindusthan College of Arts and Science
Coimbatore - 641 028.

List of Open Elective Papers	
Open Electives	Yoga for Human Excellence Human Health & Hygiene Indian Culture and Heritage Indian Constitution and Political System Consumer Awareness and Protection Professional Ethics and Human Values Human Rights, Women's Rights & Gender Equality Disaster Management Green Farming Corporate Relations start a Business? Research Methodology and IPR General Studies for Competitive Examinations IIT JAM Examination (for Science only) CUCET Examination
VAC Papers	
Courses offered by the Departments to other Programmes	

Note: VAC / JOC courses can be added along with the above open electives

Co-ordinator
 Academic Audit Cell
 Indian College of Technology

Regulations

1. Internship / Institutional Training / **Mini-Project** is related to the discipline can be permitted to complete during the end of I and III semesters for minimum seven days each and permitted to submit a report.

Internship / Institutional Training	Not more than seven days
Mini project	Depends on the departments

2. Project work is considered as a special course involving application of knowledge in problem solving / analyzing /exploring a real-life situation. A Project work may be given in lieu of a discipline specific elective paper.
3. **FAST TRACK SYSTEM:**

Two core courses DSE- V& DSE- VI are the subjects which are to be related with NPTEL courses.

The Students have the options of taking two subjects of the sixth semester of B.Sc., Physics programme through NPTEL / Swayam portal from the list given or offered by NPTEL and approved by the department for which credit transfer is permitted. The students should inform the department prior to the registration of the course and get due approval for the same. If the student completes these courses before the start of the sixth semester, the student can be considered for a fast track programme, and do the project work alone during the sixth semester apart from the self-study paper. Once the student submits the successful course completion credentials as required by the college for the NPTEL/SWAYAM online courses, then the credit transfer will be considered for qualifying the degree.

4. **If the students who are all completed the NPTEL courses before semester -VI, they can avail exemption from appearing exams of DSE- V & DSE- VI in Fast track scheme.**
5. NSS / NCC/Sports/YRC / SIS / SA is mandatory for all students as per New Education Policy and the students must attend the allocated hours within two years and complete the programme. They will be evaluated during the end of second year (Fourth Semester) and also a certificate will be issued.
6. SDR – Student Development Report to be received by the department from the students till end of the fifth semester. (Evidences of Curricular activities and Co-curricular activities)
7. For online courses minimum of **Two (2)**certificates in any of the online platform is mandatory.

Extension Activities

NSS – National Service Scheme, as enrolled member with the College Unit.

NCC – National Cadet Corps, as enrolled member with the College Unit.

SPORTS – Sports & Games Participation with College Team

YRC/RRC–Youth Red Cross / Red Ribbon Club, as enrolled member with the College Unit.

Rotaract Club - Rotaract Club, as enrolled member with the College Unit.

SIS – Special Interest Subjects, as approved by the Academic Council

SA – Social Activity for not less than 50 hours with Non-Governmental Organization (NGO) like Aram Foundation / Shanthi Social Service / Siruthuli / KulangalPathukappuAmaipu /Old age Home / Nature Foundation / etc.

SEC-Skill Enhancement Course (Life Skills/ Aptitude/Placement Training/online course/Internship/SDR)

ECC- Ability Enhancement Compulsory Course (Environmental Studies/ Human Rights/Internet Security/ General Awareness/ Law of Ethics/Extension Activities)

UG Courses- Scheme of Evaluation (Internal & External Components)

(For the students admitted during the academic year 2021-2022 and onwards)

1. Internal Marks for all UG

Components	Marks
Test I	5
Test II	5
Model Exam	10
Assignment	5
Attendance*	5
TOTAL	30

*Split-up of Attendance Marks

- ✱ 75-79 - 1 marks
- ✱ 80-84 - 2 marks
- ✱ 85-89 - 3 marks
- ✱ 90-94 - 4 marks
- ✱ 95-100 - 5 marks

2. a) Components for Practical I.E.

Components	Marks
Test -I	20
Test - II	20
Total	40

b) Components for Practical E.E.

Components	Marks
Experiments	50
Record	5
Viva	5
Total	60

3. Institutional/ Industrial Training, Mini Project and Major Project Work

Institutional / Industrial Training (I.E)		Mini Project (I.E)	Major Project Work		
Component	Marks	Marks	Component	Marks	Total Marks
Work diary	25	-	I.E		
Report	50	50	a)Attendance	10	
Viva-voce	25	50	b)Review/Work diary*	30	40
Total	100	100	E.E** a) Final report	40	
			b)Viva-voce	20	60
			Total		100

*Review is for Individual Project and Work Diary is for Group Projects
(group consisting of minimum 3 and maximum 5)

**Evaluation of report and conduct of viva voce will be done jointly by Internal and External Examiners

4. Guidelines for Internet Security/Human Rights/Law of Ethics/Environmental studies (Part IV)

Components	Marks
Two Tests (each 2 hours) of 20 marks each [4 out of 7 descriptive type questions 4 x 5 = 20 Marks]	40
Two assignments (2 x 5)	10
Total	50

5. Guidelines for General Awareness (Part IV)

Components	Marks
Two Tests (each 2 hours) of 25 marks each [50 objective type questions $50 \times 1/2 = 25$ Marks]	50

6. Guidelines for Open Elective (Part IV)

No of Activities	Marks
Two Tests (each 3 hours) of 50 marks each [5 out of 8 descriptive type questions $5 \times 10 = 50$ Marks]	100

7. Value Added Courses / Aptitude/Placement courses:

Components	Marks
Two Test (each 1 hour) of 25 marks each QP is objective pattern ($25 \times 1 = 25$)	50
Total	50

Guidelines:

1. The passing minimum for these items should be 40%
2. If the candidate fails to secure 40% passing minimum, he / she may have to reappear for the same in the subsequent Semesters
3. Item No's:4,5,6 and 7 are to be treated as 100% Internal papers.
4. For item No.07, Tests conducted through online modules (Google Form/any other)

UG PATTERN

QUESTION PAPER PATTERN FOR CIA I and CIA II EXAM

Reg.No:-----

Q.P.CODE:

HINDUSTHAN COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)

----- DEGREE CIA-I/CIA-II EXAMINATIONS -----20---

(----- SEMESTER)

BRANCH: -----

SUBJECT NAME: -----

Time: Two Hours

Maximum:50 Marks

SECTION - A (6 x 1 = 6 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(Q.No: 1 to 6: Multiple choice/Fill up the blanks /True or False questions)

SECTION - B (4x 5 = 20 marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(Q.No: 7 to 10 Either Or type)

SECTION - C (2x12 = 24 marks)

Answer any TWO Questions out of THREE Questions

ALL Questions Carry EQUAL Marks

(Q.No: 11 to 13)

QUESTION PAPER PATTERN FOR MODEL/END SEMESTER EXAMINATION

Reg.No:-----

Q.P.CODE:

HINDUSTHAN COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)

----- DEGREE MODEL EXAMINATIONS -----20-----

(-----SEMESTER)

BRANCH : -----

SUBJECT NAME:-----

Duration: Three Hours

Maximum: 70 Marks

SECTION - A (10x1=10 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(Q.No 1 to 10 Multiple choice/Fill up the blanks /True or False questions)

(Two questions from each unit)

SECTION - B (5x6=30 Marks)

Answer ALL Question

ALL Questions Carry EQUAL Marks

(Q.No 11 to 15 Either or type)

(One question from each Unit)

SECTION- C (3x10=30 Marks)

Answer any THREE Questions out of FIVE Questions

ALL Questions carry EQUAL Marks

(Q.No 16 to 20) (One question from each Unit)

For UG (Question paper pattern) (Max. 70 marks)

Sec-A (10x1=10marks)	All Questions will be in K1 Level
Sec-B (5x6=30marks) Either or type	4 Questions will be in K1 Level, 3 Questions will be in K2, K3 each
Sec-C (3x10=30marks) Any 3 out of 5 questions	2 Questions will be in K2, 3 Questions will be in K3 & K4 level

Course Code:	21PHU01	Course Title						Batch:	2021-2022 and Onwards
		MECHANICS, PROPERTIES OF MATTER AND ACOUSTICS						Semester:	I
Hrs/Week:	6	L	6	T	-	P	-	Credits:	4

COURSE OBJECTIVES:

1. To study the principles of rigid body and modes of rocket
2. To apply the elastic and bending behavior of beams in the real life applications
3. To understand the properties of fluid
4. To explore the surface behavior of liquids
5. To study the basic properties and production of ultrasonics by different methods

COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Understand the general principles of mechanics	K2
CO2	Recall the fundamentals of bending and torsion of a body	K3
CO3	Interpret the basic concept of hydrodynamics and viscosity	K3
CO4	Analyze the surface tension	K4
CO5	Remember the acoustic concepts in sound applications	K1

KI- Remember, K2- Understand, K3- Apply, K4- Analyze

SYLLABUS

21PHU01	MECHANICS, PROPERTIES OF MATTER AND ACOUSTICS	Sem: I
Unit No.	Topics	Hours
I	Mechanics Rigid body - moment of inertia - radius of gyration - moment of inertia of a solid cylinder, cylindrical shell, solid sphere, spherical shell, hollow sphere with external and internal radii. Centre of gravity of a solid and hollow tetrahedron, solid and hollow hemisphere, solid cone centre of pressure - centre of pressure of a vertical rectangular lamina - vertical triangular lamina. Rockets and Satellites - basic principles of rocket motion - Orbital velocity - launching of a satellite, types of satellite orbits - theory of Geosynchronous satellites - trajectory adjustments - launch site tracking, radio telemetry, block diagram of satellite and earth space probes - exploration of solar systems.	15
II	Elasticity Bending of beams – Definitions – Expression for the bending moment – Depression for the loaded end of a cantilever – Depression at the mid-point of a beam loaded at the middle Uniform bending of a beam – Measurement of Young's modulus by Non-Uniform bending and Uniform bending – I section of girders. Torsion of a body – Expression for torque per unit twist – Determination of rigidity modulus: Static torsion method (Searle's apparatus -	15

III	Hydrodynamics and Viscosity Equation of continuity – Energy of the liquid – Euler's equation for unidirectional flow – Bernoulli's theorem – Explanation and Applications of Bernoulli's theorem. Coefficient of Viscosity – Poiseuille's formula for the flow of a liquid through a capillary tube – Corrections to Poiseuille's formula – Searle's viscometer: Rotating cylinder method of finding coefficient of viscosity– Modification of Poiseuille's formula for gases.	15
IV	Surface Tension Introduction – Explanation of Surface tension on Kinetic theory – Surface energy – Work done in increasing the area of a surface – Work done in blowing a bubble – Angle of contact. Neumann's triangle – Excess pressure inside a curved liquid surface – Determination of surface tension of a liquid by Jaegar's method – Variation of surface tension with temperature – Quincke's method and Drop weight method of determining the surface tension of liquid – Problems in Work done and Excess pressure.	15
V	Sound Laws of Transverse vibrations in strings – Determination of frequency by Melde's method –Musical Sound and Noise – Characteristics of Musical Sound-Intensity of Sound. Acoustics of buildings– Reverberation – Sabine's Reverberation formula– Determination of Absorption coefficient. Ultrasonics – Piezo-electric effect and Magnetostriction effect – Production of Ultrasonics by Piezoelectric oscillator and Magnetostriction oscillator – Detection and Applications of Ultrasonic waves.	12

Note: Distribution of marks: Problems - 20%, Theory - 80%

Teaching Methods: PowerPoint Projection through LCD, Assignment, Discussion and Activity.

TEXT BOOKS

1. Mechanics and mathematical methods by R Murugesan, S Chand & Co. Pvt. Ltd., New Delhi, 1990
2. Mechanics by J.C. Upadhaya
3. Properties of matter by Brij Lal & Subramaniam, N Eurasia publishing Co., New Delhi, 1989
4. Text book of sound by Brij Lal & Subramaniam, N Vikas Publishing House, New Delhi, 1982

REFERENCE BOOKS

1. Mechanics by D S Mathur
2. Elements of Properties of Matter by Mathur D S, Shyamlal Charitable Trust, New Delhi, 1993
3. Properties of matter by Murugesan R, S Chand & Co. Pvt. Ltd., New Delhi
4. Waves & Oscillations by Subrahmanyam N & Brij Lal, Vikas Publishing House Pvt. Ltd., New Delhi, 1994
5. Text book of sound by M N Srinivasan – Himalaya Publications (1991)

WEB RESOURCES




1. <https://www.yumpu.com/en/document/read/16977833/mechanicsproperties-of-matter-and-soundsph8a11>

MAPPING WITH PROGRAM OUTCOMES

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	M	M				
CO2	S	M	M			S	
CO3	S	M	M	M	M	M	S
CO4	S	M	M	M			
CO5	S	M	M	M	M	S	M

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
 (R. Vishalashi)	 (DR. V. BALAPRAKASH) Head of the Department Department of Physics Hindusthan College of Arts & Science Coimbatore-641 028	 Co-ordinator Curriculum Development Cell Hindusthan College of Arts & Science Coimbatore-641 028.

Course Code:	21PHU02	Course Title						Batch:	2021-2022 and Onwards
		ELECTRICITY AND MAGNETISM						Semester:	I
Hrs/Week:	6	L	6	T	-	P	-	Credits:	4

COURSE OBJECTIVES:

1. To understand the general concepts in Electrostatics
2. To analyze the chemical and heating effect of current
3. To learn the basics of LCR function with various theorems
4. To study the fundamental working concepts of ac currents
5. To analyze the relations between b, h and m

COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Identify the fundamental principles of Electrostatics.	K2
CO2	Relate the concepts in chemical effect of electric current.	K4
CO3	Provide a knowledge of DC Circuits for LCR circuits.	K1
CO4	Develop the knowledge of AC currents in various applications.	K3
CO5	Predict the knowledge of concepts in magnetic properties.	K4

KI- Remember, K2- Understand, K3- Apply, K4- Analyze

SYLLABUS

21PHU02	ELECTRICITY AND MAGNETISM	Sem: I
Unit No.	Topics	Hours
I	Electrostatics: Coulomb's law – electric intensity and electric potential – electrical images – electric intensity and potential due to an earthed conducting sphere applying the principle of electrical images – electric dipole – potential and intensity due to a dipole – capacity – capacitance of a spherical and cylindrical capacitor – energy of a charged capacitor – loss of energy due to sharing of charges.	15
II	Chemical effects of Electric Current: Faraday's laws of Electrolysis – ionic velocities and mobilities. Calculation and experimental determination of ionic mobilities – transport number. Thermoelectricity – Peltier coefficient – Thomson coefficient – application of thermodynamics to a thermocouple and connected relations – thermoelectric diagram and uses.	15

III	DC Circuits: Growth and decay of current in a circuit containing resistance and inductance. Growth and decay of charge in a circuit containing resistance and capacitor – growth and decay of charge in a LCR circuit – condition for the discharge to be oscillatory – frequency of oscillation – network analysis – Thevenin and Norton's Theorems.	15
IV	Alternating Current: Peak, average and RMS values of AC voltage and current – power factor and current values in an AC circuit containing LCR (reactance and impedance) series and parallel resonant circuits – power in an AC circuit – wattless current – choke coil – construction and working of transformers – energy losses – AC motors – single phase, three phase – star and delta connections – electric fuses – circuit breakers.	15
V	Magnetic Properties of Materials: Susceptibility – permeability – intensity of magnetization and the relation $B = \mu_0(H + \mu_m I)$ – I-H and B-H curves for a magnetic material using magnetometer method and ballistic galvanometer method. Terrestrial magnetism – magnetic elements – dip circle – Kew magnetometer – causes of earth's magnetic field.	12

Note: Distribution of marks: Problems – 20%, Theory – 80%

Teaching Methods: PowerPoint Projection through LCD, Assignment, Discussion and Activity.

TEXT BOOKS

1. Electricity & Magnetism by M. Narayanamurthy & N. Nagarathnam, National publishing Company, revised edition)
2. Electricity & Magnetism by K. K. Tewari, S.Chand & Co., 3rd Edition, 2001.
3. Electricity & Magnetism by Brij Lal & Subramaniam.

REFERENCE BOOKS

1. Electricity & Magnetism by D.Chattopadhyay, Books & allied Publishers.
2. Text Book of Applied Electronics by R.S. Sedha S.Chand & co, New Delhi, 2002.
3. Fundamentals of Physics, 6th Edition, by D.Halliday, R.Resnick and J.Walker, Wiley, NY, 2001.
4. Physics, 4th Edition, Vols I, II & II Extended by D.Halliday, R.Resnick and K.S.Krane, Wiley, NY, 1994.
5. CRC Handbook of Physics & Chemistry, 80th Ed., CRS Press, NY, 1999.
6. The Feynman Lectures on Physics, Vols. I, II, and III, by R. P. Feynman, R B Leighton and M Sands, Narosa, New Delhi, 1998.
7. Basic Electronics, Edition by B. Grob, McGraw- Hill, NY, 1989.

WEB RESOURCES




1. https://www.researchgate.net/publication/239045863_Web_Resources_for_Teaching_Introductory_electric_and_Magnetic_Fields_The_MIT_TEAL_Physics_802_Electricity_Magnetism_Project.
2. <https://iwant2study.org/ospsg/index.php/interactive-resources/physics/05-electricity-and-magnetism>

MAPPING WITH PROGRAM OUTCOMES

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	M		M		M	
CO2	S	M	M			M	M
CO3	M	S	M	M	M		M
CO4	M	S	M	M	M		M
CO5	S	M	M			M	M

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
 (N. Suresh)	 C.Dr. V. BAZA PRAKASH	

Head of the Department
 Department of Physics
 Hindusthan College of Arts & Science
 Coimbatore-641 028

Co-ordinator
 Curriculum Development Cell
 Hindusthan College of Arts & Science
 Coimbatore-641 028.

Course Code:	21PHU04	Course Title						Batch:	2021-2022 and Onwards
		HEAT AND THERMODYNAMICS						Semester:	II
Hrs/Week:	4	L	4	T	-	P	-	Credits:	4

COURSE OBJECTIVES:

1. To learn the basics of thermometry using calorimeter.
2. To understand the kinetic theory of gases along with low temperature physics.
3. To explore the principle and laws of thermodynamics in applications.
4. To understand the concepts involved in transmission of heat by conduction.
5. To provide the laws involved in transmission of heat by radiation.

COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Understand the basic concepts of heat and thermodynamics.	K2
CO2	Remember the kinetic theory of gases and low temperature physics.	K1
CO3	Analyze the concepts of thermodynamics for various functions.	K4
CO4	Realize the transmission of thermal energy by conduction process.	K2
CO5	Apply the various thermal laws in thermal radiation.	K3

KI- Remember, K2- Understand, K3- Apply, K4- Analyze

SYLLABUS

21PHU04	HEAT AND THERMODYNAMICS	Sem: II
Unit No.	Topics	Hours
I	Thermometry and Calorimetry Temperature coefficient of Resistance – Platinum Resistance Thermometer – Thermocouple – Seeback Effect – Peltier Effect – Thermoelectric thermometer – Calorimetry – Thermoelectric diagrams – Specific heat of solids – Radiation correction – Copper block calorimeter – Nernst vacuum calorimeter – Newton's law of cooling – Specific heat capacity of a liquid by cooling – Specific heat capacity of gases – Relation between them – Joly's differential steam calorimeter – Continuous flow electric method.	10
II	Kinetic Theory of Gases Postulates – Mean free path – Degrees of freedom – Velocity distribution and Theorem of equipartition of energy – Viscosity of gases – Van der Waals equation – Critical constants and their determination.	10

	Low Temperature Physics Vaule-Thomson Effect – Liquefaction of air, hydrogen and helium – Helium I and II – Peculiar properties of HeII – Adiabatic demagnetization Superconductivity: Discovery – Critical Temperature – Meissner Effect – Isotope Effect – Applications.	
III	Thermodynamics Carnot's Theorem – Otto Cycle – Petrol Engine – Diesel engine – Clapeyron's Latent heat equation – Entropy – Change in entropy (Reversible and irreversible process) – Temperature-Entropy diagram – Entropy of a perfect gas – Maxwell's thermodynamical relations and applications – Helmholtz function – Gibb's function – Enthalpy.	10
IV	Thermal Conduction Conduction, convection and radiation – Coefficient of thermal conductivity, thermal diffusivity – Steady state – Lee's disc method of determining the thermal conductivity of a bad conductor – Searle's method – Forbe's method – Spherical Shell method – Cylindrical flow of heat – Thermal conductivity of rubber – Thermal conductivity of glass – Wiedemann-Franz law.	8
V	Thermal Radiation Black body – Kirchoff's law of heat radiation – Prevost's theory of heat exchange – Stefan's law – Mathematical derivation – Derivation of Newton's law of cooling from Stefan's law – Experimental verification of Stefan's law – Distribution of energy in the spectrum of black body – Derivation of Planck's law – Derivation of Wien's law and Rayleigh-Jean's law from Planck's law.	10

Note: Distribution of marks: Problems – 20%, Theory – 80%

Teaching Methods: PowerPoint Projection through LCD, Assignment, Discussion and Activity.

TEXT BOOKS

1. Heat and thermodynamics by Brij lal and Subramaniam, S Chand & Company Pvt Ltd, 2007.
2. Richard H Dittman and Zemansky MW, Heat and Thermodynamics, 3rd Special Edition, McGraw Hill, 2008.

REFERENCE BOOKS

1. Thermal Physics by R. Murugesan
2. Text book of heat by JB Rajam
3. Text book of heat by Saha

WEB RESOURCES

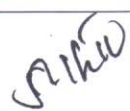


1. https://web.iit.edu/sites/web/files/departments/academic-affairs/academic-resource-center/pdfs/Thermodynamic_Properties.pdf
2. <http://chemed.chem.purdue.edu/genchem/topicreview/bp/ch21/chemical.php>
3. <https://www.khanacademy.org/science/physics/thermodynamics>

MAPPING WITH PROGRAM OUTCOMES

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S	M					
CO2	S	M			M		M
CO3	M	S			M	M	
CO4	S	M	M		M	M	S
CO5	S	M	M		M		M

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations. ✓

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
 (Dr. V. Senthil)	 (Dr. V. BALAPRAKASH)	 Co-ordinator Curriculum Development Cell

Head of the Department
Department of Physics
Hindusthan College of Arts & Science
Coimbatore-641 028

Hindusthan College of Arts & Science,
Coimbatore-641 028.

Course Code:	21PHU05	Course Title						Batch:	2021-2022 and Onwards
		ENERGY PHYSICS						Semester:	II
Hrs/Week:	4	L	4	T	-	P	-	Credits:	4

COURSE OBJECTIVES:

1. To create an awareness about the renewable energy resources.
2. To learn photo thermal based energy systems and applications.
3. To learn the applications of solar energy to overcome the energy crisis.
4. To understand the concepts of wind energy.
5. To learn the concepts of energy from biomass and biogas systems.

COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Remember the basic energy sources from the environment.	K1
CO2	Understand the solar radiation and its measurement technical concepts.	K2
CO3	Apply the uses of solar energy in different methods.	K3
CO4	Interpret the ideas and components of wind energy.	K3
CO5	Evaluate the basic physics ideas in renewable energy sources, biomass and biogas-oriented applications.	K4

KI- Remember, K2- Understand, K3- Apply, K4- Analyze

SYLLABUS

21PHU05	ENERGY PHYSICS	Sem: II
Unit No.	Topics	Hours
I	Introduction to Energy Sources An Introduction to Energy Sources and their availability – Conventional energy sources – nonconventional energy sources – renewable energy sources – advantages of renewable energy – obstacles to the implementation of renewable energy systems – prospects of renewable energy sources.	10
II	Solar Radiation and its Measurement Introduction – solar constant – solar radiation at the Earth's surface – solar radiation measurements – solar radiation data – solar energy collectors – physical principles of the conversion of solar radiation into heat – flat-plate collectors – typical liquid collectors – typical air collectors –concentrating collector – focusing and non-focusing types – selective absorber coatings.	10
III	Application of Solar Energy Solar water heating-space heating – active and passive system – solar cooling – absorption – air-conditioning system – solar electric power generation – solar photovoltaic cells Application of solar energy in agricultural and industrial – solar	10

	distillation – solar pumping – solar furnace – solar cooking-simple box type cooker – concentric parabolic type solar cooker – Multireflector type solar cooker.	
IV	Wind Energy Basic principles of wind energy conversion – wind data and energy estimation - basic components of wind energy conversion system (WECS)– advantages and disadvantages of WECS – types of wind machines-horizontal axis wind machines – vertical axis wind machines – application of wind energy – environmental aspects – global warming.	8
V	Renewable Energy Sources, Biomass and Biogas Energy from the ocean: ocean thermal electric conversion (OTEC) – tidal energy – geothermal energy. Energy from biomass: biomass conversion technologies – wet and dry processes – photosynthesis; Biogas generation; introduction-basic processes and energetic – advantages of anaerobic digestion – factors affecting the bio-digestion and generation of gas.	10

Note: Distribution of marks: Problems - 10%, Theory - 90%

Teaching Methods: PowerPoint Projection-through LCD, Assignment, Discussion and Activity.

TEXT BOOKS

1. Non-conventional energy sources by G.D.Rai

REFERENCE BOOKS

1. Solar energy by M.P.Agarwal
2. Solar energy by S.P.Suhatme
3. Principles of solar engineering by Kreith&Krider

WEB RESOURCES

1. <https://www.youtube.com/watch?v=Zgp86PVXXuQ>
2. <https://vikaspedia.in/energy/energy-basics/sources-of-energy>
3. http://www.vssut.ac.in/lecture_notes/lecture1428910296.pdf




MAPPING WITH PROGRAM OUTCOMES

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S		S			M	
CO2	S	M	S		M	M	M
CO3	M	S	S	S	M	S	S
CO4	S	M	S	M	M	M	M
CO5	S	S	S	M	M	M	S

Co-ordinator
Curriculum Development Cell
Hindustan College of Arts & Science,
Chennai-600 078

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations:

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
 (R. Amirthavalli)	 Dr. V. BALAPRASANTH	

Head of the Department
Department of Physics
Hindusthan College of Arts & Science,
Coimbatore-641 028

Co-ordinator
Curriculum Development Cell
Hindusthan College of Arts & Science,
Coimbatore-641 028.

Course Code:	21PHU06	Course Title						Batch:	2021-2022 and Onwards
		SEMICONDUCTOR DEVICES						Semester:	II
Hrs/Week:	4	L	4	T	-	P	-	Credits:	4

COURSE OBJECTIVES:

1. To understand the theory of semiconductors.
2. To know the available basic semiconductor devices in the field.
3. To learn and implement the functions of Bipolar Junction Transistors.
4. To learn the functions of Field Effect Transistors.
5. To understand the concepts and uses of thyristors.

COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Recall the essential fundamentals of atomic structure for semiconductor devices.	K1
CO2	Understand the functions and applications of various semiconductor devices.	K2
CO3	Analyze the functions and modes of Bipolar Junction Transistor.	K4
CO4	Analyze the switching and amplification applications of Field Effect Transistors.	K4
CO5	Apply the concepts in various thyristors.	K3

KI- Remember, K2- Understand, K3- Apply, K4- Analyze

SYLLABUS

21PHU06	SEMICONDUCTOR DEVICES	Sem: II
Unit No.	Topics	Hours
I	Atomic Structure and Semiconductor Physics Bohr's atomic model – Energy levels – Energy bands – Energy bands in solids – Classification of solids and energy bands – Semiconductor – Bonds in semiconductors – Energy band description of semiconductors – Effect of temperature on semiconductor – Hole current – Intrinsic semiconductor– Extrinsic semiconductor – n-type and p-type semiconductor – Majority and minority carriers – PN junction – VI Characteristics.	10
II	Special Diodes Zener diode – Zener diode as a voltage regulator – Tunneling effect and Tunnel diode – Varactor diode – PIN diode – Schottky Diode – Step recovery diode – Thermistor – Gunn diode –LED – Photo diode.	10

III	Bipolar Junction Transistors (BJT) Introduction– Transistor as an Amplifier – CB, CE and CC Configurations– Comparison of transistor configurations – Transistor load line analysis – Operating point – Cut off and Saturation points – Power ratings – Transistor biasing – Types: Self bias, Fixed bias and Potential divider bias – Photo transistor.	10
IV	Field Effect Transistors Junction Field Effect Transistor – Operation – Transfer characteristics –Comparison of FET and BJT – MOSFET – Types: Depletion - Enhancement – Drain and transfer characteristics – MOSFET as a resistor– Advantage of N-Channel MOSFET over P-Channel.	10
V	Thyristors Overview – Construction and Working: Silicon Controlled Rectifier (SCR)– TRIAC – DIAC – Uni Junction Transistor (UJT): Operation – UJT relaxation oscillator – Silicon Controlled Switch (SCS)- Silicon Unilateral Switch (SUS) – Silicon Bilateral Switch (SBS) – Opto-electronic devices.	8

– Note: Distribution of marks: Problems - 20%, Theory - 80%

Teaching Methods: PowerPoint Projection through-LCD, Assignment, Discussion and Activity.

TEXT BOOKS

1. V.K. Mehta, "Principles of Electronics", S.Chand, 1997. (Unit-I, II & III).
2. R.S. Sedha, "A Text Book of Applied Electronics", S.Chand, 3rd Revised Edition, 2008. (Unit-IV & V)

REFERENCE BOOKS

1. B.L.Theraja "Basic Electronics Solid State", S.Chand, 1998.
2. S. Salivahanan, N. Suresh Kumar & A. Vallavaraj, "Electronics Devices and Circuits", Tata McGraw Hill Publishing Company Limited, New Delhi, 8th edition.
3. S.M.Sze, "Semiconductor Devices: Physics and Technology", Wiley India (P.) Ltd, Second Edition, 2008.

WEB RESOURCES




1. <https://nptel.ac.in/courses/108/108/108108122/>

MAPPING WITH PROGRAM OUTCOMES

PO CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S					M	M
CO2	S	M		M			
CO3	M	S		S	M	S	M
CO4	M	M		S	M	S	M
CO5	M	M		S	M	S	M

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
 (Dr. V. Balaprakash)	 (Dr. V. BALAPRAKASH)	 Co-ordinator Curriculum Development Cell Hindusthan College of Arts & Science, Coimbatore-641 028.

Head of the Department
Department of Physics
Hindusthan College of Arts & Science
Coimbatore-641 028

Course Code:	21PHU08	Course Title						Batch:	2021-2022 and Onwards
		PRACTICAL – I : GENERAL PHYSICS - I						Semester:	II
Hrs/Week:	3	L	-	T	-	P	3	Credits:	2

COURSE OBJECTIVES:

1. To gain knowledge in the scientific methods and learn the process of measuring different Physical variables.
2. To explore the field of properties of matter.
3. To understand the basic concepts in acoustics.
4. To learn the principles of thermodynamics.
5. To have a deep knowledge of the optic experiments.

COURSE OUTCOMES (CO)

S.No	COURSE OUTCOME	BLOOMS LEVEL
CO1	Remember the various measurement techniques for less than cm range.	K1
CO2	Execute the rigidity modulus using Torsional Pendulum.	K3
CO3	Analyze the transmission of sound waves through the air.	K4
CO4	Apply the thermodynamics principles in thermal conductors.	K3
CO5	Understand the operation of solid prism and liquid prism spectrometer.	K2

KI- Remember, K2- Understand, K3- Apply, K4- Analyze

SYLLABUS

21PHU08	PRACTICAL – I : GENERAL PHYSICS - I	Sem: II
S.No.	Topics	
	(Any 10 Experiments)	
1	Young's Modulus – Non-Uniform bending (Pin & Microscope).	
2	Young's Modulus – Uniform bending (Pin & Microscope).	
3	Young's Modulus – Uniform bending (Optic Lever).	
4	Rigidity Modulus of a Wire – Torsion Pendulum.	
5	Acceleration due to gravity – Compound Pendulum.	
6	Surface Tension of a Liquid and Interfacial Surface Tension of liquids – Drop Weight method.	
8	Viscosity of Highly Viscous Liquids – Stoke's method.	
9	A.C. Frequency – Sonometer.	
10	Specific Heat Capacity – Newton's Law of Cooling.	
11	Thermal Conductivity of a bad conductor – Lee's disc method.	

- | | |
|----|--|
| 12 | Refractive index – Solid Prism – Spectrometer. |
| 13 | Refractive index – Liquid Prism – Spectrometer. |
| 14 | Specific Resistance – Post-office Box. |
| 15 | Calibration of Low Range Voltmeter – Potentiometer. |
| | Focal length of combination of lenses separated by a distance. |

Teaching Methods: Practical Demonstration

TEXT BOOKS

1. R. K. Shukla & Anchal Srivastava. Practical Physics, New Age International (P) Ltd, Publishers, (Formerly Wiley Eastern Limited), 4835/24, Ansari Raod, Daryagani, New Delhi-11002. 2006.
2. C. L. Arora, B.Sc., Practical Physics, S. Chand & Company Ltd. Ram Nagar, New Delhi-110055. 2007.

REFERENCE BOOKS

1. G. L. Squires, Practical Physics, Fourth edition, Cambridge University Press, 2001.
2. Geeta Sanon, B. Sc., Practical Physics, 1st Edition. R. Chand & Co, 2007.

WEB RESOURCES




1. <https://www.olabs.edu.in/?pg=topMenu&id=40>
2. <https://praxilabs.com/en/ExperimentDetails.aspx?ID=19>

MAPPING WITH PROGRAM OUTCOMES

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	S						S
CO2	S	M		M	M	S	S
CO3	S	M	M	M	M	S	S
CO4	S	M		M	M	S	S
CO5	S	M	M	M	M	S	S

ASSESSMENT PATTERN (if deviation from common pattern)

Follows common pattern of Internal and External assessment, suggested in the Regulations.

Course Designed by	Verified by HOD	Approved by CDC Co-ordinator
 (Mrs. R. Vishalashi)	 Dr. V. BALAPRASANTH	 Co-ordinator Curriculum Development Cell Hindusthan College of Arts & Science, Coimbatore-641 028.

Head of the Department
Department of Physics
Hindusthan College of Arts & Science
Coimbatore-641 028