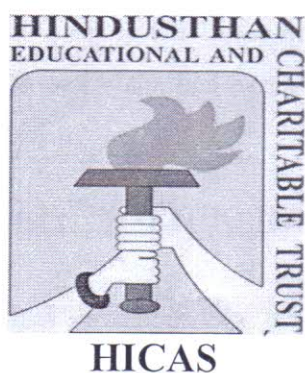


**CURRICULUM FRAMEWORK AND SYLLABUS
FOR OUTCOME BASED EDUCATION IN**

Bachelor of Science in Physics Degree Program

**FOR THE STUDENTS ADMITTED FROM THE
ACADEMIC YEAR 2019– 2020 BATCH ONLY**



**HINDUSTHAN COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)
(Affiliated to Bharathiar University and Accredited by NAAC)**

**COIMBATORE-641028
TAMILNADU, INDIA.**

Phone: 0422-4440555

Website: www.hindusthan.net/hicas

HINDUSTHAN COLLEGE OF ARTS AND SCIENCE

DEPARTMENT OF PHYSICS

VISION

To provide world class 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,

PEO1: Produce graduates who excel in the competencies and values required for leadership to serve a rapidly evolving global community.

PEO2: Endow the students with creative and analytical skills, this will equip them to become entrepreneurs.

PROGRAM OUTCOME (PO)

B.Sc (Physics) Students will be able to

PO1: Apply the knowledge of Physical science to solve real life problems.

PO2: Enhance the student's academic abilities, personal qualities and transferable skills which will give them an opportunity to develop as responsible citizens.

PO3: Provide a systematic understanding of core physical concepts, their theories and applications.

PO4: Communicate the results of theoretical calculations and laboratory experiments in a clear and concise manner that incorporates the scientific conventions used by physicists worldwide.

PROGRAM 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.

**HINDUSTHAN COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)
COIMBATORE – 641028**

SCHEME OF EXAMINATION – CBCS PATTERN

B.Sc., PHYSICS

(For the students admitted from the Academic year 2019 – 2020 Batch Only)

Course Code	Course Type	Course Title	Lecture Hours / Week	Exam. Dur. Hrs	Max. Marks			Credit Points
					IE	EE	Total	
FIRST SEMESTER								
Part – I								
19LAT01 19LAH01 19LAM01 19LAF01	MIL	Tamil - I/Hindi - I/Malayalam - I/French – I	6	3	30	70	100	3
Part – II								
19ENG01	AECC	English – I	6	3	30	70	100	3
Part – III								
19PHU01	DSC	Properties of Matter and Sound	6	3	30	70	100	5
19PHU02	DSE	Material Science	6	3	30	70	100	5
19PHU03	GE	Mathematics-I	6	3	30	70	100	5
***	DSC	Practical I: General Physics – I	3	-	-	-	-	-
SECOND SEMESTER								
Part – I								
19LAT02 19LAH02 19LAM02 19LAF02	MIL	Tamil - II/Hindi - II/Malayalam - II/French – II	6	3	30	70	100	3
Part – II								
19ENG02	AECC	English – II	6	3	30	70	100	3
Part – III								
19PHU04	DSC	Heat and Thermodynamics	5	3	30	70	100	5
19PHU05	DSE	Energy Physics	5	3	30	70	100	5
19PHU06	GE	Mathematics-II	3	3	30	70	100	5
19PHU07	DSC	Practical I: General Physics – I	3	3	40	60	100	2
Part – IV								
19GSU01	AEE	Value Education - Human Rights	2	-	100	-	100	2
Students Should Complete Value Added Courses, Communicative English and Soft Skills at the End of the First Year								
THIRD SEMESTER								
Part – I								
19LAT03 19LAH03 19LAM03 19LAF03	MIL	Tamil - III/Hindi - III/Malayalam - III/French – III	6	3	30	70	100	3
Part – II								
19ENG02	AECC	English – III	6	3	30	70	100	3
Part – III								
19PHU08	DSC	Optics	5	3	30	70	100	5
19PHU09	GE	Chemistry – I	5	3	30	70	100	5
19PHU10	SEC	Semiconductor Devices	5	3	30	70	100	5
***	DSC	Practical II: Semiconductor Devices and Digital Electronics Lab	3	-	-	-	-	-
***	GE	Practical III: Allied Chemistry Practical	3	-	-	-	-	-
Part – IV								
19GSU02	AEE	Environmental Studies	2	-	100	-	100	2
FOURTH SEMESTER								
Part – I								
19LAT04 19LAH04 19LAM04 19LAF04	MIL	Tamil - IV/Hindi - IV/Malayalam - IV/French – IV	6	3	30	70	100	3

		Part – II						
19ENG04	AECC	English – III	6	3	30	70	100	3
		Part – III						
19PHU11	DSC	Electricity and Magnetism	5	3	30	70	100	4
19PHU12	GE	Chemistry – II	5	3	30	70	100	4
19PHU13	SEC	Digital Electronics	5	3	30	70	100	4
19PHU14	DSC	Practical II: Semiconductor Devices and Digital Electronics Lab	3	3	40	60	100	2
19PHU15	GE	Practical III: Allied- Chemistry Practical	3	3	40	60	100	2
		Part – IV						
19GSU03	AEE	Internet Security	2	-	100	-	100	2
		Part – V						
19GSU04	AECC	Extension Activity	-	-	100	-	100	G
Students Should Complete Value Added Courses, Online Courses (Or) Participation Certificates For Seminars, Workshops From Other Institutions For Each Semester And Womens Studies / Interdisciplinary at the end of Second Year								
Extension Activity – means all those activities under NSS / NCC / Sports / YRC Programme and other Co and extracurricular activities offered under part V of the programme. Every student shall participate compulsorily for a period of not less than two years (4 semesters) in any one of these programmes.								
FIFTH SEMESTER								
		Part – III						
19PHU16	DSC	Quantum Mechanics and Relativity	5	3	30	70	100	4
19PHU17	DSC	Nuclear Physics	5	3	30	70	100	4
19PHU18	DSC	Communication Electronics	5	3	30	70	100	4
19PHU19	SEC	C Programming	4	3	30	70	100	3
19PHU20A	DSE	Bio Physics	4	3	30	70	100	2
19PHU20B		Atomic Physics and Spectroscopy						
***	DSC	Practical IV: General Physics –II	3	-	-	-	-	-
***	SEC	Practical V: C-Programming Lab	3	-	-	-	-	-
		Part – V						
19GSU05	AEE	General Awareness	-	-	100	-	100	2
19GSU06	AECC	Law of Ethics	-	-	100	-	100	2
SIXTH SEMESTER								
		Part – III						
19PHU21	DSC	Thin Films and Nano Technology	5	3	30	70	100	4
19PHU22	DSC	Biomedical Instrumentation	5	3	30	70	100	4
19PHU23	SEC	Microprocessors	5	3	30	70	100	4
19PHU24A	DSE	Optical Fiber and Fiber Optic Communication System	4	3	30	70	100	2
19PHU24B		Consumer Electronics						
19PHU25	DSC	Practical IV: General Physics –II	3	3	40	60	100	4
19PHU26	SEC	Practical V: C-Programming Lab	3	3	40	60	100	4
19ELU27	DSE	Project Work	4	-	40	60	100	4
Students Should Complete Value Added Courses, Online Courses / Entrepreneurship / Startups / Job Oriented Courses and Placement Training at the end of the Third Year								
								140

No of papers	Course Type	Total Credit Points
4	Modern Indian Language (MIL)	12
6	Ability Enhancement Compulsory course (AECC)	14
4	Ability Enhancement Elective (AEE)	8
12	Discipline Specific course (DSC)	47
5	Discipline Specific Elective (DSE)	18
5	Skill Enhancement Course (SEC)	20
5	Generic Elective (GE)	21
41	TOTAL	140

REGULATION

1. Internal Marks

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

*Split-up of Attendance Marks

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

QUESTION PAPER PATTERN FOR I.E TEST I and II

Duration: Two Hours

Maximum: 50Marks

SECTION - A (6 x 1 = 6 Marks)

Answer **ALL** Questions

ALL Questions Carry **EQUAL** Marks

Multiple choice/Fill up the blanks /True or False questions

SECTION - B (4x 5 = 20 Marks)

Answer **ALL** Questions

ALL Questions Carry **EQUAL** Marks

Either or Type

SECTION - C (3x 8 = 24 Marks)

Answer **ALL** Questions

ALL Questions Carry **EQUAL** Marks

Either or Type

QUESTION PAPER PATTERN FOR IE Model Examination

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 (5x4=20 Marks)

Answer **ALL** Question

ALL Questions Carry **EQUAL** Marks

Q.No 11 to 15: Either or type questions
(One question from each Unit)

SECTION- C (5x8=40 Marks)

Answer **ALL** Questions

ALL Questions carry **EQUAL** Marks

Q.No 16 to 20: Either or type questions (One question from each Unit)

2 a) Components for Practical I.E.

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

2 b) Components for Practical E.E.

Components	Marks
Completion of Experiments	50
Record	5
Viva	5
Total	----- 60 =====

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

<u>Institutional/Industrial Training</u>		<u>Mini Project</u>	<u>Major Project Work</u>	
Components	Marks	Marks	Components	Marks
I.E Work Diary Report	25	50	I.E a) Attendance 10Marks	40
Viva –voce	50	50	b) Review/ Work Diary* ¹ 30 Marks	
Examination	25			
Total	<u>100</u> =====	<u>100</u> =====	E.E* ² a) Final Report 40 Marks	60
			b) Viva-voce 20Marks	
			Total	<u>100</u> =====

*¹ Review is for Individual Project and Work Diary is for Group Projects (group consisting of minimum 3 and maximum 5)

*² Evaluation of report and conduct of viva voce will be done jointly by Internal and External Examiners

4. Components for Value Education (Part IV)

S.No.	Components	Marks
a)	Attendance	30 marks
	96% and above - 30 marks	
	91% to 95% - 25 marks	
	86% to 90% - 20 marks	
	76% to 85% - 10 marks	
b)	Participation in group activity	30 marks
c)	Assignment (2 x 10)	20 marks
d)	Test(1 hr for 20 marks)	20 marks
	2 out of three questions, 10 marks each	
	Total	100 marks

On completion of the above components students will be remarked as follows:

Range of marks	Equivalent remarks
80 and above	Exemplary
70 – 79	Very good
60 – 69	Good
50 – 59	Fair
40 – 49	Satisfactory
Below 39	Not Satisfactory = Not completed

The passing minimum for this paper is 40%

In case, the candidate fails to secure 40% passing minimum, he / she may have to reappear for the same in the subsequent semesters.

5. Guidelines for Environmental Studies (Part IV)

The paper Environmental Studies is to be treated as 100% IE course which is offered in III Semester for II year UG students. The classes will be handled for two hours per week till the end of the Semester. At least one field trip should be arranged.

Total Marks for the subject = 100

Components	Marks
Two Tests (2 x 30)	60
Field visit and report (10 + 10)	20
Two assignments (2 x 10)	20
Total	100

The question paper pattern is as follows:

Test I – 2 hours [3 out of 5 essay type questions] 3 x 10 = 30Marks

Test II – 2 hours [3 out of 5 essay type questions] 3 x 10 = 30Marks

Total 60Marks

The passing minimum for this paper is 40%

In case, the candidate fails to secure 40% passing minimum, he / she may have to reappear for the same in the subsequent semesters.

6. Guidelines for Skill based subject - Internet Security (Part IV)

Components	Marks
Two Tests (2 x 40)	80
Two assignments (2 x 10)	20
Total	100

The question paper pattern is as follows:

Test I – 2 hours [4 out of 7 essay type questions] 4 x 10 = 40Marks

Test II – 2 hours [4 out of 7 essay type questions] 4 x 10 = 40Marks

Total 80Marks

The passing minimum for this paper is 40%

In case, the candidate fails to secure 40% passing minimum, he / she may have to reappear for the same in the subsequent semesters.

7. Guidelines for General Awareness (Part IV)

Components	Marks
Two Tests (2 x 50)	100

The question paper pattern is as follows:

Test I – 2 hours [50 multiple choice questions] $50 \times 1 = 50$ Marks

Test II – 2 hours [50 multiple choice questions] $50 \times 1 = 50$ Marks

Total 100 Marks

The passing minimum for this paper is 40%

In case, the candidate fails to secure 40% passing minimum, he / she may have to reappear for the same in the subsequent semesters

8. Guidelines for Law of Ethics (Part V)

Components	Marks
Two Tests (2 x 50)	100

The question paper pattern is as follows:

Test I – 2 hours [5 out of 8 essay type questions] $5 \times 10 = 50$ Marks

Test II – 2 hours [5 out of 8 essay type questions] $5 \times 10 = 50$ Marks

Total 100 Marks

The passing minimum for this paper is 40%

In case, the candidate fails to secure 40% passing minimum, he / she may have to reappear for the same in the subsequent semesters.

9. Guidelines for Extension Activity (Part V)

At least two activities should be conducted within this semester (IV) consisting of two days each. The activities may be Educating Rural Children, Unemployed Graduates, Self Help Group etc.

The marks may be awarded as follows

No of Activities	Marks
2 x 50 (Each Activity for two days)	100

10. QUESTION PAPER PATTERN FOR EE (Part III Theory Papers)

Duration: Three Hours

Maximum: 70Marks

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 (5x4=20 Marks)

Answer **ALL** Question

ALL Questions Carry **EQUAL** Marks

Q. No 11 to 15: Either or type questions
(One question from each Unit)

SECTION- C (5x8=40 Marks)

Answer **ALL** Questions

ALL Questions carry **EQUAL** Marks

Q. No 16 to 20: Either or type questions
(One question from each Unit)

Programme Code:	BPH	Programme Title: B.Sc., Physics		
Course Code:	19PHU01	Course Title	Batch:	2019-2020 and onwards
		PROPERTIES OF MATTER AND SOUND	Semester:	I
Hrs/Week:	6		Credits:	5

Course Objective

To enable the students to learn, understand the basic physics, properties of matter, laws of gravitation and the principles of acoustics.

Course Outcomes (CO)

K1	CO1	Understand the fundamental principles of elastic behavior and working of torsional pendulum.
K2	CO2	Acquire the knowledge of hydrodynamics and viscosity basic concepts.
K3	CO3	Analyze the surface tension, gravitation, Newton's law of gravitation and Kepler's laws of planetary motion.
K4	CO4	Analyze the acoustic concepts in sound applications.

Mapping of Outcomes

PO CO	PO1	PO2	PO3	PO4
CO1	S	S	M	S
CO2	S	S	L	S
CO3	S	M	M	S
CO4	S	M	L	S

S - Strong; M-Medium; L-Low.


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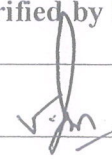

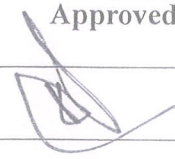
Code No	Course	Semester No
19PHU01	PROPERTIES OF MATTER AND SOUND	I
Unit No	Content	Hours
I EN	Elasticity Bending of beams – Definitions – Expression for the bending moment – Depression for the loaded end of a cantilever – Depression at the mid-point of a beam loaded at the middle Uniform bending of 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 - Scale and telescope) and Dynamic torsion method.	12
II	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.	12
III	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.	12
IV	Gravitation Newton's law of gravitation – Kepler's laws of planetary motion – Determination of G by Boy's experiment – Gravitational field and gravitational potential – Gravitational potential and field due to a spherical shell – Gravitational potential and field due to a solid sphere – Variation of 'g' with latitude, altitude and depth– The compound pendulum (theory and experiment).	12
V EN	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 – 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

Text Books:


1. *Properties of Matter* by R. Murugesan, S. Chand Publishing, 1994.
2. *A Textbook of Sound* by Brijlal and Subrahmanyam, Vikas publishing, 1995.

Reference Books:

1. *Properties of Matter* by N.Subramanyam, Brijlal, S.chand and co.
2. *Waves and oscillations* by N. Subramanyam, Brijlal, Vikas Publishing.
3. *Properties of Matter and Acoustics* by R. Murugesan and Kiruthiga Sivaprasath, S.Chand Publisher.

Course Designed by	Verified by HOD	Checked by	Approved by
			

(R. Vishalashi)


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Programme Code:	BPH	Programme Title: B.Sc., Physics		
Course Code:	19PHU02	Course Title	Batch:	2019-2020 and onwards
		Material Science	Semester:	I
Hrs/Week:	6		Credits:	5

Course Objective

To learn the basic concepts of material science and apply it to various physical problems.


Course Outcomes (CO)

K1	CO1	Remember the material science basic principles and conceptions.
K2	CO2	Understand the phase diagram and phase transformation technique operation and its applications.
K3	CO3	Solve problems based on electron theory of solids and for different materials.
K4	CO4	Analyze electrical and magnetic properties of materials.

Mapping of Outcomes

PO CO	PO1	PO2	PO3	PO4
CO1	S	S	M	L
CO2	S	M	M	L
CO3	S	M	M	L
CO4	S	M	L	L


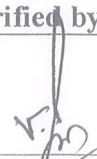
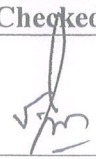

S - Strong; M-Medium; L-Low.


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Code No	Course	Semester No
19PHU02	Material Science	I
Unit No	Content	Hours
I	Material Science Classification of materials - Engineering requirements of materials - Material structure - Types of Bonds and their energies - Bond formation mechanism - Ionic bond - covalent bond examples ceramics - thermal and electrical properties - uses. Metallic bond - comparison of bonds [Dispersion bonds, Dipole bonds and Hydrogen bonds]. Crystal Imperfections - Types of imperfections - Thermal vibrations - point, line and surface imperfections - Frank - Read source.	13
II	Phase Diagrams Basic terms - solid solutions - Hume - Rothery's rules - Intermediate phase - phase diagrams - Gibb's Phase rules - Time - Temperature cooling curves - construction of phase diagrams - the Lever rule - eutectic systems- eutecoid systems - peritectic and peritectoid systems Ternary equilibrium diagram.	10
III	Phase Transformation Rate of transformation - Nucleation [Homogeneous, Heterogenous] - Nucleation and growth - Applications of Phase transformations - Micro constituent of iron - carbon system - The allotropy of iron- Iron - Carbon equilibrium diagram - formation of Austenite - TTT Diagram - transformation Austenite upon continuous cooling.	12
IV	Electron theory of metals Fundamental theories of electrons [Drude and Lorentz theory and Sommer field free electron theory] - Electron energies in a metal - zone theory of solids - energy gaps - Density of states - zones in conductors, insulators and semiconductors - Factors affecting electrical resistance of materials.	12
V	Electrical and magnetic properties of materials Resistivity - Conductivity - Semiconductors - classification of semi-conductors on the basis of Fermi energy and Fermi level - Insulators - Dielectrics - Ferro electricity - Electro striction - Piezoelectricity - uses of dielectrics - Capacitors Dielectric strength - Magnetic properties of classification - magneto striction - Magnetic Domain - Soft and Hard magnetic materials.	13

Text Books:

1. *Materials Science and processes in SI units* by SK Hajra Choudhury, Indian Book distributing company
2. *Materials Science* by G.K. Narula; K.S. Narula; V.K. Gupta, Tata McGraw-Hill
3. *Material Science* by R.B. Gupta for AMIE Satya Prakashan New Delhi.

Course Designed by	Verified by HOD	Checked by	Approved by
 (N. Suresh)			

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Co-ordinator
Curriculum Development Cell
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Programme Code:	BPH	Programme Title: B.Sc., Physics		
Course Code:	19PHU04	Course Title	Batch:	2019-2020 and onwards
		Heat and Thermodynamics	Semester:	II
Hrs/Week:	6		Credits:	5

Course Objective

To learn the basics of thermometry, kinetic theory of gases, thermodynamics and heat transfer mechanisms.

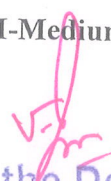
Course Outcomes (CO)

K1	CO1	Remember the basic concepts of heat and thermodynamics.
K2	CO2	Understand the kinetic theory of gases and low temperature physics.
K3	CO3	Analyze the concepts of thermodynamics and thermal conduction, convection and radiation.
K4	CO4	Interpret and discuss the various thermal laws in thermal radiation.

Mapping of Outcomes

PO CO	PO1	PO2	PO3	PO4
CO1	S	S	M	M
CO2	S	S	M	L
CO3	S	M	M	L
CO4	S	S	L	L

S - Strong; M-Medium; L-Low.


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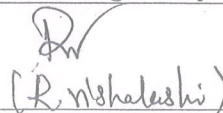
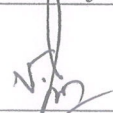


Code No	Course	Semester No
19PHU04	Heat and Thermodynamics	II
Unit No	Content	Hours
I	Thermometry Temperature coefficient of Resistance – Platinum Resistance Thermometer – Thermocouple – Seebeck Effect – Peltier Effect – Thermoelectric thermometer – Calorimetry – Thermoelectric diagrams - Specific heat 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.	13
II	Kinetic Theory of Gases Postulates – Mean free path – Degree of freedom – Velocity distribution and Theorem of equipartition of energy – Viscosity of gases – Van der Waals equation – Critical constants and their determination. Low Temperature Physics Joule-Thomson Effect – Liquefaction of air, hydrogen and helium – Helium I and II – Peculiar properties of He II – Adiabatic demagnetization. Superconductivity: Discovery – Critical Temperature – Meissner Effect – Isotope Effect – Applications.	10
III EM	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.	12
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.	12
V SD	Thermal Radiation Black body – Kirchhoff'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.	13

Text Book:

1. Heat and thermodynamics by Brij lal and Subramaniam, S Chand & Company Pvt Ltd, 2007.

Reference Books:

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

Course Designed by	Verified by HOD	Checked by	Approved by
 (R. Nishalashi)			


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Department of Physics
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Co-ordinator
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Programme Code:	BPH	Programme Title: B.Sc., Physics		
Course Code:	19PHU05	Course Title	Batch:	2019-2020 and onwards
		ENERGY PHYSICS	Semester:	II
Hrs/Week:	3		Credits:	2

Course Objective

To understand the energy crisis and the alternative energy solutions.


Course Outcomes (CO)

K1	CO1	Identify the basic energy sources.
K2	CO2	Understand solar radiation and its measurement technical concepts.
K3	CO3	Analyze the application of solar energy.
K4	CO4	Apply the basic physics ideas in renewable energy sources, biomass and biogas-oriented applications.

Mapping of Outcomes

PO CO	PO1	PO2	PO3	PO4
CO1	S	S	M	S
CO2	S	S	L	S
CO3	S	M	M	S
CO4	S	M	L	S

S - Strong; M-Medium; L-Low.


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Code No	Course	Semester No
19PHU05	ENERGY PHYSICS	II
Unit No	Content	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.	12
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.	12
III SD	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 distillation – solar pumping – solar furnace – solar cooking-simple box type cooker – concentric parabolic type solar cooker – Multi reflector type solar cooker.	12
IV EM	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.	12
V EN	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.	12

Text Book:


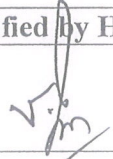
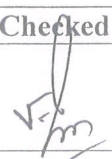

1. *Non-conventional energy sources* by G.D.Rai

Reference Books:

1. *Solar energy* by M.P.Agarwal

2. *Solar energy* by S.P.Suhatme

3. *Principles of solar engineering* by Kreith&Krider

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 (N. Suresh)			

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Programme Code:	BPH	Programme Title: B.Sc., Physics		
Course Code:	19PHU07	Course Title	Batch:	2019-2020 and onwards
		Practical I: General Physics -I	Semester:	I & II
Hrs/Week:	3		Credits:	2

Course Objective

Students will demonstrate an acceptable level of understanding of the major principles of physics.


Course Outcomes (CO)

K1	CO1	Identifying the significance of the experimental approach through actual experimentation
K2	CO2	Understand the operation of solid prism and liquid prism spectrometer.
K3	CO3	Analyze and display the operation of Low Range Voltmeter – potentiometer.
K4	CO4	Determine rigidity modulus using Torsional Pendulum and rigidity modulus using Torsional Pendulum.

Mapping of Outcomes

PO CO	PO1	PO2	PO3	PO4
CO1	S	S	M	L
CO2	S	M	M	L
CO3	S	M	L	L
CO4	S	M	L	L




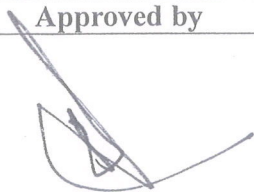
S - Strong; M-Medium; L-Low.



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Code No	Course	Semester No
19PHU07	Practical I: General Physics -I	I & II

(Any 18 Experiments)

- GN
EN
1. Young's Modulus – Non-Uniform bending (Pin & Microscope).
 2. Young's Modulus – Uniform bending (Optic Lever).
 3. Rigidity Modulus of a Wire – Torsion Pendulum (with mass).
 4. Acceleration due to gravity – Compound Pendulum.
 5. Surface Tension of a Liquid and Interfacial Surface Tension of liquids – Drop Weight method.
 6. Viscosity of Highly Viscous Liquids – Stoke's method.
 7. A.C. Frequency – Sonometer.
 8. Specific Heat Capacity – Newton's Law of Cooling.
 9. Thermal Conductivity of a bad conductor – Lee's disc method.
 10. Refractive index – Solid Prism – Spectrometer.
 - ST
3
11. Refractive index – Liquid Prism – Spectrometer.
 12. Specific Resistance – Post-office Box.
 13. Calibration of Low Range Voltmeter – Potentiometer.
 14. Moment of a Magnet – Tan C Position.
 15. Magnetic flux – Field along the axis of a coil.
 16. Moment of a magnet – Field along the axis of a coil.
 17. Determination of rigidity modulus using Torsional Pendulum – Without masses.
 18. Determination of rigidity modulus using Torsional Pendulum – With identical masses.
 19. Determination of dispersive power of a prism using spectrometer.
 20. Determination of Cauchy's constant using spectrometer.
 21. Determination of Laser parameters – Laser Grating.
 22. Frequency of tuning fork – Sonometer.
 - EN
23. Determination of velocity of ultrasonic waves in liquids.
 24. Compound pendulum.
 25. Characteristics of junction diode.

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Programme Code:	BPH	Programme Title: B.Sc., Physics		
Course Code:	19PHU08	Course Title	Batch:	2019-2020 Batch Only
		OPTICS	Semester:	III
Hrs/Week:	5		Credits:	5

Course Objective:

To enable the students to learn optical instrument, objects in images, propagation of light, nature and behaviour of light, vibration of light laser and its applications.


Course Outcomes (CO)

K1	CO1	Understand the fundamental principles of optical properties.
K2	CO2	Provide knowledge of the behaviour of light.
K3	CO3	To inspire interest for the knowledge of concepts is physical and geometrical optics.
K4	CO4	Analyze the concepts in light applications.

Mapping of Outcomes

PO CO	PO1	PO2	PO3	PO4
CO1	S	S	S	M
CO2	S	M	S	S
CO3	S	M	M	S
CO4	S	L	L	S

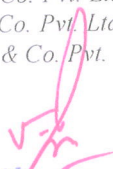
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Code No	COURSE	Semester No
19PHU08	OPTICS	III
Units	Content	Hours
I	Thick Lenses: Principal foci and principal points - Thick lens formula - Power of a thick lens - Optic centre of a lens - Spherical aberration and lenses - Methods of minimizing spherical aberration - Condition for minimum spherical aberration in the case of two lenses separated by a distance - Chromatic aberration in lenses - Condition for achromatism of two thin lenses (in contact and out of contact) - coma - astigmatism - Curvature of the field - Huygen's and Ramsden's eye pieces.	13
II	Dispersion: Dispersion produced by a thin prism - Angular dispersion - Dispersive power - Cauchy's formula - combination of prisms to produce - Dispersion without deviation - Deviation without dispersion - Achromatic prisms Direct vision spectroscopy - Constant deviation spectroscopy - Rainbows and haloes.	10
III	Interference: Colours of thin films - Air wedge - Determination of diameter of a thin wire by air wedge - Test for optical flatness - Haidinger's fringes - Michelson's Interferometer - Theory - Applications - λ , thickness of thin transparent material and resolution of spectral lines - Brewster's fringes - Refractive index of gases - Jamin's & Rayleigh's Interferometers - Stationary waves in light - Colour photography (principle only), Holography (principle only).	13
IV	Diffraction: Fresnel diffraction - Diffraction at Circular aperture, Opaque circular disc, Straight edge and Narrow wire - Fraunhofer diffraction - single slit - Double slit - Plane diffraction grating - theory and experiment to determine wave length - Normal Incidence - Oblique incidence - Missing orders - Overlapping spectra - Concave reflection grating with theory. Rayleigh's criterion for Resolution - Resolving power of Microscope, Telescope, Prism and Grating.	12
V	Polarization: Double refraction - Nicol prism - polarizer and analyzer - Huygen's explanation of double refraction in uniaxial crystals - Dichroism - Polaroids and their uses - Double image polarizing prisms - quarter wave plate & half wave plate - Plane, elliptically and circularly polarized light - Production and detection - Babinet's Compensator - Optical Activity - Fresnel's explanation of optical activity - Specific Rotatory Power - Determination using Laurent's Half Shade Polarimeter.	12

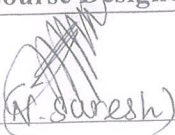


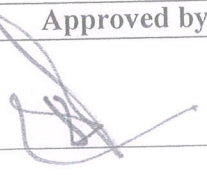
TEXT BOOKS:


1. Optics by Subramaniam. N. & Brij Lal, S. Chand & Co. Pvt. Ltd., New Delhi, 2006.
2. Optics by Khanna D.R. & Gulati H.R., R. Chand & Co. Pvt. Ltd., New Delhi, 1984.
3. Optics and Spectroscopy by Murugesan, S. Chand & Co. Pvt. Ltd., New Delhi. 2010.


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REFERENCE BOOKS:

1. *Fundamentals of Optics* by Jenkins A Francis and White E. Harvey, McGraw Hill Inc., New Delhi, 1976.
2. *Optical Physics* by Lipson. S.G., Lipson H., and Tannhauser D.S., Cambridge University press, (1995).
3. *Fundamentals of Optics* by Raj M.G., Anmol Publications Pvt. Ltd., (1996), New Delhi.
4. *Fundamentals of Physics*, 6th Edition, by D.Halliday, R.Resnick and J.Walker. Wiley, NY, 2001.
5. *Physics*, 4th Edition Vols I, II & II Extended by D.Halliday, R.Resnick and K.S.Krane, Wiley, NY, 1994.
6. *CRC Handbook of Physics & Chemistry*, 80th Ed., CRS Press, NY, 1999.
7. *The Feynman Lectures on Physics*, Vols. I, II, and III, by R. P. Feynman, R B Leighton and M Sands, Narosa, New Delhi, 1998.

Course Designed by	Verified by HOD	Checked by	Approved by
 (A. Suresh)			


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Programme Code:	BPH	Programme Title: B.Sc., Physics		
Course Code:	19PHU09	Course Title	Batch:	2019-2020 Batch Only
		CHEMISTRY -I	Semester:	III
Hrs/Week:	5		Credits:	5

Course Objective:

To enable the students to learn chemical bonding, covalent bonds, photochemistry, electrochemistry and chemical equilibrium.


Course Outcomes (CO)

K1	CO1	Remember the chemical bonding structure
K2	CO2	Understand and apply the geometric and isomeric properties of molecules
K3	CO3	Analyse the laws of photochemistry and principles of electrochemistry
K4	CO4	Investigate the decomposition of molecules and order of chemical reactions

Mapping of Outcomes

PO CO	PO1	PO2	PO3	PO4
CO1	L	S	M	L
CO2	M	S	M	M
CO3	S	S	M	L
CO4	M	S	M	M

S – Strong; M-Medium; L-Low.


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19PHU09	CHEMISTRY- I	III
Unit No.	Topics	Hours
I	Chemical Bonding Molecular orbital theory: bonding, antibonding and non-bonding orbitals - Molecular orbitals - MO configuration of H ₂ , N ₂ , O ₂ , F ₂ - Bond order - Diamagnetism and paramagnetism. Preparation – properties - structure and uses of Borane:NaBH ₄ , Borazole.	12
II	Photochemistry& Phase Rule Photochemistry – Grotthus - Draper law and Stark - Einstien's law of photochemical equivalence, Quantum yield - Example for photochemical reactions: Hydrogen - Chlorine reaction (elementary idea only). Photosynthesis-Phosphorescence and Fluorescence - Phase Rule: Phase rule and the definition of terms in it, application of phase rule to water system.	12
III	Covalent bond Orbital overlap, hybridization, geometry of organic molecules: CH ₄ , C ₂ H ₄ and C ₂ H ₂ - Inductive effect – Electrometric – mesomeric - hyperconjugative and steric effects in properties of compounds. Stereoisomerism-Conditions of optical activity - Optical isomerism of tartaric acid – Racemisation: Resolution of racemates - Geometrical isomerism of maleic and fumaric acids.	12
IV	Electro Chemistry Electro Chemistry - Kohlrausch law, measurement of conductance - pH determination - Conductometric titrations - Galvanic cells: EMF, standard electrode potentials, reference electrodes - Corrosion: Methods of prevention.	12
V	Chemical equilibrium Chemical equilibrium - Criteria of homogeneous and heterogeneous equilibria: decomposition of HI, N ₂ O ₄ , CaCO ₃ and PCl ₅ . Chemical Kinetics: Order of reaction and their determinations, activation energy, effects of temperature on reaction rate.	12

Text Books:

1. Malik, Wahid U., G.D. Tuli and R.D. Madan. "Selected Topics in Inorganic Chemistry", 7th ed., New Delhi S.Chand & Company Ltd., 2007.
2. Text book of Physical Chemistry, P.L.Soni, D.B. Dharmarke, Sultan Chand & Sons. 2009.

Reference Books:

1. Puri B.R., Sharma L.R and Pathania M.S, "Principles of Physical Chemistry", Vishal Publishing Co., New Delhi. 2018.
2. Puri B.R and Sharma L.R, "Inorganic chemistry", Shobanlal Nagin Chand and Co., New Delhi. 2013.
3. Advanced Organic Chemistry, B.S. Bahl, Arun bahl, S.Chand & Co. 2014.
4. Organic Chemistry, Vol. 1, 2, 3, S. M. Mughgergee, S.P. Singh, R.P. Kapoor, Wiley Eastern. 2017.
5. Essentials of Physical Chemistry, B.S. Bahl and G.D. Tuli, S.Chand & Co. 2014.

Course Designed by	Verified by HOD	Checked by	Approved by
A. Geetha (Dr. A. GEETHA)			

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 Hindusthan College of Arts & Science
 Coimbatore-641 028

Co-ordinator
 Curriculum Development Cell
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 Coimbatore-641 028.

Programme Code:	BPH	Programme Title: B.Sc., Physics		
Course Code:	19PHU10	Course Title	Batch:	2019-2020 Batch Only
		SEMICONDUCTOR DEVICES	Semester:	III
Hrs/Week:	5		Credits:	5

Course Objective

To equip the students to learn the construction, working and characteristics of various semiconductor devices.


Course Outcomes (CO)

K1	CO1	Recall the essential fundamentals of atomic structure and semiconductor devices.
K2	CO2	Understand the principles and functions of semiconductor diodes for switching applications.
K3	CO3	Analyze the switching and amplification applications of transistor.
K4	CO4	Demonstrate the control applications using power electronic semiconductor devices.

Mapping of Outcomes

PO CO	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	S	S	L	L
CO3	S	M	L	L
CO4	S	M	L	L

S - Strong; M-Medium; L-Low.


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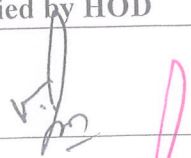


Code No	Course	Semester No
19PHU10	SEMICONDUCTOR DEVICES	III
Unit No.	Content	Hours
I	Atomic Structure and Semiconductor Physics Bohr's atomic model – Energy levels – Energy bands – Energy bands in solids – Classification of solids and energy bands – Semiconductor – Bonds in semiconductors – Energy band 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.	12
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.	12
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.	12
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.	12
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.	12

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.

Course Designed by	Verified by HOD	Checked by	Approved by
			

(Dr. K. Thangavel)

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Programme Code:	BPH	Programme Title: B.Sc., Physics		
Course Code:	19PHU11	Course Title	Batch:	2019-2020 Batch Only
		ELECTRICITY AND MAGNETISM	Semester:	IV
Hrs/Week:	5		Credits:	4

Course Objective:

To learn the basic concepts of Electricity and Magnetic properties of materials and apply it to various physical problems.


Course Outcomes (CO)

K1	CO1	Identify the fundamental principles of Electrostatics.
K2	CO2	Provide knowledge of AC and DC Circuits.
K3	CO3	Predict the knowledge of concepts in magnetic properties.
K4	CO4	Analyze the concepts in chemical effect of electric current.

Mapping of Outcomes

PO CO	PO1	PO2	PO3	PO4
CO1	S	S	M	S
CO2	S	S	L	S
CO3	S	M	S	M
CO4	S	M	S	L

S – Strong; M-Medium; L-Low.


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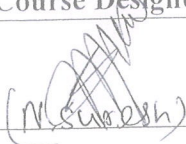
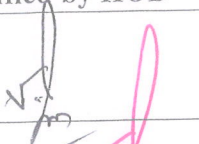

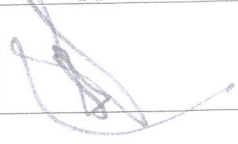
Code No	COURSE	Semester No
19PHU11	ELECTRICITY AND MAGNETISM	IV
Units	Content	Hours
I	Electrostatics: Coulomb's law - electric intensity and electric potential - electrical images - electric intensity and potential due to an earthed conducting sphere applying the principle of electrical images - electric 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.	12
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.	12
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.	12
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.	12
V	Magnetic Properties of Materials: Susceptibility - permeability - intensity of magnetization and the relation $B = \mu_0 (H + I)$ - 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

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.

Course Designed by	Verified by HOD	Checked by	Approved by
			

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Curriculum Development Cell
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Programme Code:	BPH	Programme Title: B.Sc., Physics		
Course Code:	19PHU12	Course Title	Batch:	2019-2020 Batch Only
		CHEMISTRY - II	Semester:	IV
Hrs/Week:	5		Credits:	4

Course Objective:

To learn the basic concepts related to UV-Visible Spectroscopy, Nanoscience, nuclear chemistry, physical chemistry, solutions types chemically and chromatography.


Course Outcomes (CO)

K1	CO1	Remember the basic concept related to UV-Visible Spectroscopy and nanoscience
K2	CO2	Understand the knowledge in nuclear chemistry
K3	CO3	Analyse the structure of solids
K4	CO4	Investigate the chromatographic techniques in detail

Mapping of Outcomes

PO CO	PO1	PO2	PO3	PO4
CO1	L	S	M	M
CO2	M	S	M	L
CO3	S	S	M	M
CO4	M	S	M	L

S – Strong; M-Medium; L-Low.


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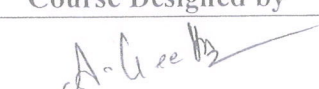
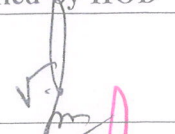


Code No	COURSE	Semester No
19PHU12	CHEMISTRY- II	IV
Units	Content	Hours
I	U.V-Visible Spectroscopy Definition of spectrum – Types: absorption and emission spectra, Electromagnetic radiation, quantization of different types of energies in molecules (translational, rotational and electronic) - Born Oppenheimer approximation. U.V-Visible Spectroscopy - Types of electronic transitions - Beer's-Lambert's law – chromophore, auxochrome, bathochromic and hypsochromic shifts – Instrumentation - Applications.	12
II	Nano Science Definition – types - quantum dots - Nano rods, fullerenes and Carbon nanotubes, nano wires and crystals, nano composites and clusters; properties of nano materials, Plasmon resonance. Preparation of Nano structured materials- Bottom up and Top down Approaches - Methods of preparation of nanomaterial: Plasma arching, Chemical vapour deposition, Electro deposition, Sol-gel synthesis, Ball-milling, Chemical reduction.	12
III	Nuclear Chemistry Natural radioactivity - radioactive series including Neptunium series, Group displacement law - Nuclear Binding energy, mass defect, Calculations - Nuclear Fission and Nuclear Fusion differences - Stellar energy - Nuclear reactors - Applications of radioisotopes-C-14 dating - rock dating.	12
IV	Physical Chemistry Solid state chemistry - elements of symmetry, plane, center and axis of symmetry - definitions. Unit cell of simple body center and face center cubic crystals - Weiss and miller indices - Nature of unit cell of NaCl and CsCl - structure of diamond and graphite.	12
V	Solutions & Chromatography Solutions-Liquid in liquid type: Raoult's law for ideal solution, positive and negative deviation from Raoult's law - Reasons and examples - Fractional distillation and Azeotropic distillation. Chromatography: principle and application of column - paper and thin layer chromatography.	12

TEXT BOOK:

1. Sharma Y.R Elements of organic spectroscopy-4 edn Sultan Chand and Company,2011

REFERENCE BOOKS:

1. Puri, Sharma and Pathania, Text-book of Physical Chemistry, Vishal Publishing co.2011
2. Madan R.I, Chemistry for degree students, S.Chand and Company Ltd, New Delhi, 2016
3. Puri B.R., Sharma L.R. and Pathania M.S. (2013), Principles of Physical Chemistry, (35th edition), New Delhi: Shoban Lal-Nagin Chand and Co.
4. Introduction to nano science Gabor L .Hornyak, Joy deep Dutta, H.F Tibbals, Anil Rao

Course Designed by	Verified by HOD	Checked by	Approved by
 (DR. A GEETHA)			

Head of the Department
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Co-ordinator
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Programme Code:	BPH	Programme Title: B.Sc., Physics		
Course Code:	19PHU13	Course Title	Batch:	2019-2020 Batch Only
		DIGITAL ELECTRONICS	Semester:	IV
Hrs/Week:	5		Credits:	4

Course Objective

To equip the students to learn with detailed knowledge in number systems, logic gates, digital IC's, comparators, flip flops, DACs and ADCs.


Course Outcomes (CO)

K1	CO1	Convert different type of codes and number systems which are used in digital systems.
K2	CO2	Employ the codes and number systems converting circuits and Compare different types of logic families which are the basic unit of different types of logic gates in the domain of economy.
K3	CO3	Analyze various methods and logical tools and know the techniques to prepare the most simplified circuit using arithmetical circuits.
K4	CO4	Design different types of with and without memory element digital electronic circuits for particular operation, within the realm of economic.

Mapping of Outcomes

PO CO	PO1	PO2	PO3	PO4
CO1	S	S	S	S
CO2	S	S	L	L
CO3	S	M	L	L
CO4	S	M	L	L

S - Strong; M-Medium; L-Low.


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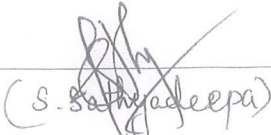



Code No	COURSE	Semester No
19PHU13	DIGITAL ELECTRONICS	IV
Units	Content	Hours
I	Number System and Codes Binary Number System – Binary to Decimal Conversion – Decimal to Binary Conversion – Octal Numbers – Hexadecimal numbers – ASCII codes – Excess three – Gray code – Error Detection and Correction.	12
II	Boolean Algebra and Logic Gates Basic Logic Gates – Universal Logic Gates – AND-OR-Invert Gates – Positive and Negative Logic – Boolean Laws and theorems – SOP – Karnaugh Map Simplifications – Don't care Conditions - POS – POS – Simplification.	12
III	Arithmetic Circuits Binary Addition - Binary Subtraction – Unsigned Binary Numbers- Sign-magnitude Numbers – 2's Complement Representation – 2's Complement Arithmetic – Adder-Subtractor – Arithmetic Logic Unit – Binary Multiplication and Division – Multiplexers – De-multiplexers – Decoder–Encoder	12
IV	Sequential Logic Circuits Flip Flops: RS, Clocked RS, D, JK, JK Master Slave and T Flip Flops. Counters: Asynchronous counter – Synchronous counter – Up/Down counter – Modulus counters – Decade counter. Shift Registers: Serial In/Serial Out – Serial In/Parallel Out – Parallel In/Serial Out – Parallel In/Parallel Out.	12
V	D/A and A/D Converters Digital to Analog converters: Weighted Resistor Method – R-2R Ladder Method – Accuracy and Resolution of DAC. Analog to Digital converters: Simultaneous converter – Counter type converter –Continuous type converter –Successive approximation type converter –Dual slope converter – Accuracy and resolution of ADC.	12

Text Book:

1. Donald P. Leach, Albert Paul Malvino & Goutam Saha, "Digital Principles and Applications", Tata McGrawHill, 7th Edition, 2011.

Reference Books:

1. Thomas L. Floyd & R.P. Jain, "Digital Fundamentals", Pearson Education, 8th Edition, 2005.
2. M. Morris Mano, "Digital Logic and Computer Design", PHI, 2005.
3. M. Morris Mano, "Digital Design", PHI, 2005.

Course Designed by	Verified by HOD	Checked by	Approved by
 (S. Sathyadeepa)			

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Programme Code:	BPH	Programme Title: B.Sc (Physics)		
Course Code:	19PHU14	Course Title	Batch:	2019-2020 Batch Only
		PRACTICAL II: SEMICONDUCTOR DEVICES AND DIGITAL ELECTRONICS LAB	Semester:	III & IV
Hrs/Week:	3		Credits:	2

Course Objective

To equip the students to learn the working and characteristics of various active electronic and digital electronics components.


Course Outcomes (CO)

K1	CO1	Understand the properties and principles of various semiconductor devices.
K2	CO2	Study the characteristics of semiconductor diodes, various transistors configurations and various digital IC's.
K3	CO3	Evaluate various combinational circuits using digital ICs.
K4	CO4	Demonstrate the knowledge by designing sequential circuits.

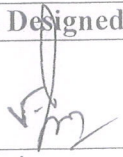
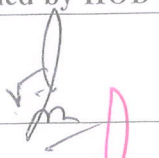

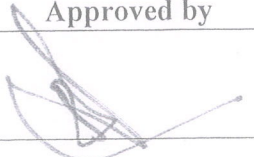
Mapping of Outcomes

PO CO	PO1	PO2	PO3	PO4
CO1	S	S	L	L
CO2	S	S	L	L
CO3	S	M	S	S
CO4	S	M	S	S


S - Strong; M-Medium; L-Low.


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Code No.	Course	Semester No.
19PHU14	PRACTICAL II: SEMICONDUCTOR DEVICES AND DIGITAL ELECTRONICS LAB	III& IV
(Any 18 Experiments)		
<ol style="list-style-type: none"> 1. Band Gap Energy of Silicon / Germanium Diode. 2. Temperature Co-efficient of Junction Diode. 3. Characteristics of PN Junction Diode. 4. Characteristics of Zener Diode. 5. Characteristics of Light Emitting Diode. 6. Common Emitter (CE) Characteristics of Transistor. 7. Common Base (CB) Characteristics of Transistor. 8. Common Collector (CC) Characteristics of Transistor. 9. Transistor Biasing Circuits. 10. Transistor as a Switch. 11. Characteristics of JFET. 12. Characteristics of MOSFET 13. Characteristics of SCR. 14. Characteristics of TRIAC. 15. Characteristics of DIAC. 16. Verification of Basic Logic Gates and Universal Gates. 17. Verification of Boolean Laws and Demorgan's Theorem. 18. Parity Generator and Checker. 19. Half Adder and Full Adder. 20. Half Subtractor and Full Subtractor. 21. Multiplexer and De multiplexers. 22. Encoder and Decoder. 23. BCD to 7-Segment Display. 24. Flip Flops. 25. Shift Registers and Ring Counter. 26. Analog to Digital Converter. 27. Digital to Analog Converter. 		

Course Designed by	Verified by HOD	Checked by	Approved by
			

(Dr. V. Balaprakash)


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Co-ordinator
 Curriculum Development Cell
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Programme Code:	PHU	Programme Title: B.Sc., Physics		
Course Code:	19PHU15	Course Title	Batch:	2019-2020 Batch Only
		Practical III – Allied Chemistry Practical	Semester	III & IV
Hrs/Week:	3		Credits :	2

Course Objectives

To equip the students to acquire practical knowledge on volumetric and organic analysis.


Course Outcomes (CO)

K1	CO1	Classification of chemicals by different methods
K2	CO2	Identification of the presence of elements
K3	CO3	Distinguish between organic compounds
K4	CO4	Examine the functional group tests

Mapping of Outcomes

PO CO	PO1	PO2	PO3	PO4
CO1	L	S	M	L
CO2	M	S	M	L
CO3	M	S	M	L
CO4	M	S	M	M

S - Strong; M-Medium; L-Low.


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Code No.	Course	Semester No.
19PHU15	Practical III - Allied Chemistry Practical (Any 18 Experiments)	III & IV
Volumetric Analysis		
<ol style="list-style-type: none"> 1. Estimation of Sodium Hydroxide using standard Sodium Carbonate. 2. Estimation of Hydrochloric acid using standard Oxalic acid. 3. Estimation of Oxalic acid using standard Sulphuric acid. 4. Estimation of Ferrous sulphate using standard Mohr salt solution. 5. Estimation of Oxalic acid using standard Ferrous sulphate solution. 6. Estimation of Ferrous ammonium sulphate using standard FeSO_4 7. Estimation of Potassium Permanganate - Standard Sodium Hydroxide 8. Estimation of hardness of water using EDTA 9. Estimation of Zinc using EDTA and standard MgSO_4 10. Estimation of Magnesium using EDTA. 11. Estimation of Ferrous iron by $\text{K}_2\text{Cr}_2\text{O}_7$ using diphenylamine as internal indicator 		
II. Organic Analysis		
<p>To distinguish between aliphatic & aromatic, saturated & unsaturated. Detection of Elements (N, S, Halogens). Functional group tests for phenols, acids (mono & di), aromatic primary amine, monoamide, diamide, carbohydrate, Functional group characterized by Confirmatory test.</p> <ol style="list-style-type: none"> 1. Systematic analysis of organic salt - Phenol 2. Systematic analysis of organic salt - Carbohydrate (monosaccharide) 3. Systematic analysis of organic salt - Fructose (disaccharide) 4. Systematic analysis of organic salt - Starch (polysaccharide) 5. Systematic analysis of organic salt - Benzoic acid (monocarboxylic) 6. Systematic analysis of organic salt - Cinnamic acid (dicarboxylic) 7. Systematic analysis of organic salt - Phthalic acid (dicarboxylic) 8. Systematic analysis of organic salt - Benzaldehyde (Aldehyde) 9. Systematic analysis of organic salt - Aliphatic Ketone 10. Systematic analysis of organic salt - Aniline (Aromatic primary amine) 11. Systematic analysis of organic salt - Benzamide (Amide) 12. Systematic analysis of organic salt - Urea (Diamide) 13. Determination of melting point of organic substances 14. Determination of boiling point of organic substances 		

Course Designed by	Verified by HOD	Checked by	Approved by
A. Geetha (DR. A. GEETHA)			

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Co-ordinator
 Curriculum Development Cell
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 Coimbatore
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Programme Code:	BPH	Programme Title: B.Sc., Physics		
Course Code:	19PHU16	Course Title	Batch:	2019-2020 Batch Only
		Quantum Mechanics and Relativity	Semester:	V
Hrs/Week:	5		Credits:	4

Course Objective:

To enable the students to learn fundamentals of Quantum Mechanics, Wave mechanical concepts and relativistic theory

Course Outcomes (CO)

K1	CO1	Remember the fundamental of Quantum mechanical concepts.
K2	CO2	Understand the basic concepts of wave mechanics.
K3	CO3	Apply the quantum concepts to solve eigen values and eigen problems.
K4	CO4	Analyze the relativistic theory to characterise the mass variations.

Mapping of Outcomes

CO \ PO	PO1	PO2	PO3	PO4
CO1	S	M	M	S
CO2	S	S	M	S
CO3	S	M	S	M
CO4	S	M	S	S

S-Strong, M- Medium, L – Low

Code No	COURSE	Semester No
19PHU16	Quantum Mechanics and Relativity	V
Units	Content	Hours
I	Origin of the Quantum Theory: Limitation of classical physics - Planck's quantum hypothesis - Einstein's theory of photoelectric effect - Compton effect - Quantum theory of specific heat - Bohr model of Hydrogen atom - Existence of stationary states - Wilson -Sommerfeld quantization rule - Elliptic orbits of Hydrogen atom - The harmonic oscillator – The rigid rotator-Particle in a box - The correspondence principle - The stern_Gerlach experiment-Inadequacy of quantum theory	12
II	Wave Mechanical Concepts: Wave nature of particles – The uncertainty principle – The principle of superposition – Wave packet – Time dependent schrodinger equation – Interpretation of the wave function – Ehrenfest's theorem – Time independent schrodinger equation – Stationary states – Admissibility condition on the wave function	12
III	General Formalism of Quantum Mechanics: Linear vector space – linear operator – Eigenfunctions and Eigenvalues – Hermitian operator – Postulates of quantum mechanics – Simultaneous measurability of observables – General uncertainty relation – Equation of motion – Momentum representation	12
IV	One-Dimensional Energy Eigenvalue Problems: Square-well potential with rigid walls – Square-well potential with finite walls – Square potential barrier – Alpha emission – Bloch waves in a periodic potential – Kronig-Penny square-well periodic potential – Linear harmonic oscillator: schrodinger method –operator method – The free particle .	12
V	Relativity Frame of reference-Newtonian principle of relativity-Special theory of relativity-Length contraction-time dilation-addition of velocity –variation of mass and velocity-Photons and gravity.	12

TEXT BOOKS:

1. Quantum mechanics – G.Aruldas –PHI learning private limited-second edition- 2019
2. Elements of quantum mechanics-K.Kamal sing-S.Chand& Company LTD

REFERENCE BOOK:

1. Modern Physics – R.Murugesan –S.Chand& Company LTD

Course Designed by	Verified by HOD	Checked by	Approved by
(Mrs. R. Vishalaski)	CDR.V. BALAPRAKASH		Co-ordinator

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

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

Programme Code:	BPH	Programme Title: B.Sc., Physics		
Course Code:	19PHU17	Course Title	Batch:	2019-2020 Batch Only
		Nuclear Physics	Semester:	V
Hrs/Week:	5		Credits:	4

Course Objective:

To learn the basic concepts of Nuclear properties of materials and apply it to various physical problems.

Course Outcomes (CO)

K1	CO1	Remember the basic fundamentals of atom and nucleus
K4	CO2	Recognize the motion of subatomic particles inside the nucleus.
K3	CO3	Interpret the concepts to disintegrate the nucleus.
K2	CO4	Understand the nuclear detector types.

Mapping of Outcomes

CO \ PO	PO1	PO2	PO3	PO4
CO1	S	S	M	S
CO2	S	M	S	S
CO3	S	S	S	M
CO4	S	M	S	M

S-Strong, M- Medium, L –Low

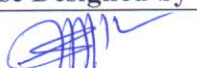



Code No	COURSE	Semester No
19PHU17	Nuclear Physics	V
Units	Content	Hours
I	Introduction to the Nucleus Introduction-Nuclear size-Nuclear spin-Classification of Nuclei- General Properties of Nucleus-Nuclear charge- Spin angular momentum- Resultant angular Momentum-Nuclear magnetic dipole moments.	12
II	Binding energy Binding energy- stability of nucleus- packing fraction- Nuclear forces. Meson theory of Nuclear forces- The liquid drop model-semi-empirical mass formula-The shell model-the collective mode.	12
III	Artificial Transmutation of Elements The discovery of artificial transmutation-Bohr theory of Nuclear Disintegration- the Q-value Equation for a nuclear reaction-Threshold energy. Nuclear reaction-Energy balance in Nuclear reaction-Threshold Energy of an endoergic reaction.	12
IV	Nuclear Fission and Fusion Nuclear fission-Energy released in Fission- Bohr and Wheeler's theory of nuclear fission-chain reaction-Multiplication factor- Atom Bomb- Nuclear Reactors-uses. Nuclear fusion-source of stellar energy.	12
V	Detectors of Nuclear Radiations Interaction between Energetic Particles and Matter-Ionization chamber- Solid state detectors- Proportional counter-Geiger Muller Counter-Diffusion Cloud Chamber- Bubble Chamber-Nuclear Emulsions-the Scintillation Counters-Cerenkov Counter.	12

TEXT BOOKS:

1. Modern Physics-R.Murugesan-S. Chand & Company Ltd- 2003
2. Atomic and Nuclear Physics – N.Subramanayam and Brijlal

REFERENCE BOOKS:

1. An Introduction to Nuclear Physics – M.R. Bhiday, Mrs V. A. Joshi
2. Nuclear Physics – B.N Shrivastav, Pragati Prakashan-2019
3. Nuclear Physics –Irving Kaplan-Narosa Publishing House-2002

Course Designed by	Verified by HOD	Checked by	Approved by
 (Mr. N. Suresh)	 CO-ORDINATOR		 Co-ordinator Curriculum Development Cell Hindusthan College of Arts & Science, Coimbatore-641 028.
<p>Head of the Department Department of Physics Hindusthan College of Arts & Science Coimbatore-641 028</p>			

Programme Code:	BPH	Programme Title: B.Sc., Physics		
Course Code:	19PHU18	Course Title	Batch:	2019-2020 Batch Only
		Communication Electronics	Semester:	V
Hrs/Week:	5		Credits:	4

Course Objective:

To enable the students to learn, the passive components and their applications in Electronic Circuits.

Course Outcomes (CO)

K1	CO1	Remember the basics of Radio Wave Propagation..
K3	CO2	Implement the concept of AM waves in various applications.
K3	CO3	Apply the knowledge about functioning of radio receivers.
K4	CO4	Analyze the various modulation techniques.

Mapping of Outcomes

CO \ PO	PO1	PO2	PO3	PO4
CO1	S	S	M	S
CO2	S	S	M	S
CO3	M	M	S	M
CO4	S	M	M	S

S-Strong, M- Medium, L – Low

Collegiate School of Engineering
 Department of Electronics and Communication Engineering
 19PHU18


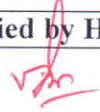

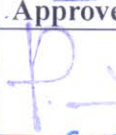
Code No	COURSE	Semester No
19PHU18	Communication Electronics	V
Units	Content	Hours
I	Radio Wave Propagation and Antennas Electromagnetic Radiation – Ground Wave, Sky Wave and Space Wave Propagation – Radiation Mechanism – Elementary Doublet – Resonant and Non resonant Antenna – Terms and Definitions of Antennas – Dipole Array – Folded Dipole – Parabolic Reflector – Horn Antenna – Lens Antenna – Helical Antenna – Discone Antenna – Log Periodic and Loop Antennas.	12
II	Amplitude Modulation Introduction – Need of Modulation – External Noise – Internal Noise – Noise Figure – Noise Temperature. Amplitude Modulation: Theory – Frequency Spectrum – Representation – Bandwidth and Power Relation. AM Generation: Balanced Modulator – Filter Method, Phase-Shift Method and Third Method of AM generation – Independent Sideband System – Vestigial Sideband Transmission.	12
III	Frequency and Phase Modulation Frequency Modulation: Theory – Mathematical Representation – Frequency Spectrum – Bandwidth and Power Relation – Phase Modulation – Pre-emphasis and De-Emphasis Comparison of Wide and narrow Band FM. FM Generation: Direct Method – Stabilized Reactance Method – Armstrong Method.	12
IV	Radio Receivers Tuned Radio Frequency (TRF) Receivers – Super heterodyne Receiver – AM Receivers: RF Section – Frequency Changing and tracking – IF Amplifiers – Detectors and AGC – Basic Block diagram of AM receiver. FM Receivers: Basic Block Diagram – Comparison of FM receiver with AM receiver – Amplitude Limiting – FM Demodulators – Slope Detection – Balanced Slope Detection – Phase Discriminator – Ratio Detector – SSB Receiver – ISB Receiver.	12
V	Pulse and Digital Modulation Pulse Amplitude Modulation – Pulse Width Modulation – Pulse Position Modulation – Pulse Code Modulation – Differential PCM – Delta Modulation – Quantization Noise – ASK – FSK – PSK – BPSK – QAM and QPSK.	12

TEXT BOOKS:

1. George Kennedy, "Electronic Communication Systems", Tata McGraw- Hill. (Unit I, II, III and IV)
2. Harold Kolimbris, "Digital Communication Systems with Satellite and Fiber Optics Applications", Pearson Education, Third Indian Reprint, 2004. (Unit-V)

REFERENCE BOOKS:

1. Herbert Taub, Donald L Scilling and Goutam Saha, "Principles of Communication Systems", Tata McGrawHill, Third Edition, 2008.
2. Dennis Roddy and John Coolen, "Electronic Communication", Pearson Education, Fourth Edition, 2008.
3. Anokhsingh & A.K. Chhabra, "Principles of Communication Engineering", S.Chand & Company Ltd, Sixth Edition, 2007.

Course Designed by	Verified by HOD	Checked by	Approved by
 (Dr. V. Bala Prakash)	 (Dr. V. BALA PRAKASH)		 Co-ordinator Curriculum Development Cell

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Coimbatore-641 028

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Coimbatore-641 028.

Programme Code:	BPH	Programme Title: B.Sc., Physics		
Course Code:	19PHU19	Course Title	Batch:	2019-2020 Batch Only
		C-Programming	Semester:	V
Hrs/Week:	4		Credits:	3

Course Objective:

On successful completion of this subject the students have the programming ability in C Language.

Course Outcomes (CO)

K1	CO1	Remember the basic concept of Cprogramme
K2	CO2	Understand the concept of arrays
K3	CO3	Apply the program on scientific and mathematical problems
K4	CO4	Analyse the programming skills in realtime applications.

Mapping of Outcomes

CO \ PO	PO1	PO2	PO3	PO4
CO1	S	S	M	M
CO2	S	S	S	S
CO3	S	M	S	M
CO4	S	M	S	S

S-Strong, M- Medium, L – Low




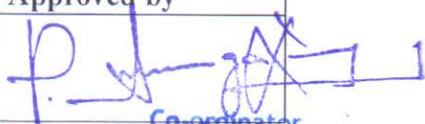
Code No	COURSE	Semester No
19PHU19	C-Programming	V
Units	Content	Hours
I	Introduction Overview of C – Names – Data types and Qualifiers – Constant – variables – Assignment of variables – Variable Initialization. Operators: Arithmetic, Assignment, Relational, Logical, Bitwise, Conditional, Compound assignment, Unary and other operators – Order of precedence and associativity of operators.	9
II	Program Control Constructs Conditional & multiple branching iteration – Jump constructs – Console input and output: Console I/O Functions – getch, putch, getchar, putchar, gets puts, print, and scan functions – Formatted I/O . Functions: Definition– prototype – recursion – simple programs.	9
III	Arrays Initializations – Multidimensional arrays – character arrays. Pointers: Declaration and initialization of pointer variables – Pointers and Functions – Pointers and arrays – Pointers and strings – Arrays of pointers and pointer to an array – Command line arguments – Dynamic memory allocation.	10
IV	Structures & Unions Definition & initializing structure variables – Array of structures – Pointer to structures – Array of pointers structures – Passing structures to functions – bit fields – Union.	10
V	Files File structure – Opening & closing of files – Character functions – Line I/O functions – Formatted I/O functions – Block I/O functions. Preprocessor directive: file inclusion – Macro substitution – Conditional compilation.	10

TEXT BOOK:

1. E.Balagurusamy, "Programming in ANSI C", Tata McGraw-Hill, 2004.

REFERENCE BOOKS:

1. Yashavant P. Kanetkar, "Let us C", BPB Publications, 14th Edition, 2016.
2. Stephen G. Kochan, "Programming in C", Addison-Wesley, Fourth Edition, 2015.
3. Rajaraman.V, "Computer Programming in C", Prentice-Hall of India Private Limited, Sixteenth Printing, 2006

Course Designed by	Verified by HOD	Checked by	Approved by
 (Dr. V. Bala Prakash)	 Dr. V. BALAPRASANNA		 Co-ordinator
Head of the Department Department of Physics Hindusthan College of Arts & Science Coimbatore-641 028.			Curriculum Development Cell Hindusthan College of Arts & Science, Coimbatore-641 028.

Programme Code:	BPH	Programme Title: B.Sc., Physics		
Course Code:	19PHU20A	Course Title	Batch:	2019-2020 Batch Only
		Bio Physics	Semester:	V
Hrs/Week:	4		Credits:	2

Course Objective:

The main objectives of this course are to deal with how physics applies to the processes of biolog, discover how to modify micro-organisms for producing bio fuel, replace bio-electricity in the place of coal and petroleum products for producing electricity.

Course Outcomes (CO)

K2	CO1	Understand the concept of bio molecular structure.
K2	CO2	Understand interactions between diffusion and interation.
K3	CO3	Apply the scanning techniques about sample on TEM and SEM.
K4	CO4	Analyse the knowledge on Radio activity.

Mapping of Outcomes

CO \ PO	PO1	PO2	PO3	PO4
CO1	S	S	M	S
CO2	S	S	M	S
CO3	S	M	M	M
CO4	S	M	S	M

S-Strong, M- Medium, L – Low

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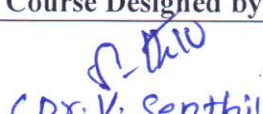
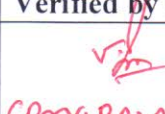

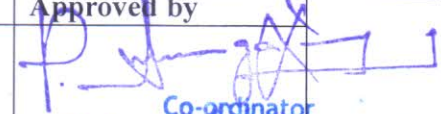
Code No	COURSE	Semester No
19PHU20A	Bio Physics	V
Units	Content	Hours
I	Structure of Biomolecules Introduction - Atomic structure - Hydrogen atom - Bonds between atoms and molecules - secondary or weak bonds - Bond energy - Disulphate bonds - Peptide bond - Structure of Proteins - Molecular weight determination - Kinetic methods - Static methods - Structure of nucleic acids - DNA - RNA.	9
II	Kinetics of Molecules I Diffusion: Factors affecting diffusion - Simple diffusion - Fick's law of diffusion - Diffusion of electrolytes - Biological significance of diffusion. Osmosis: Osmosis - Osmotic pressure - Laws of osmosis - osmometry - osmotic pressure of electrolytes. Filtration: Filtration - Passage of fluid through blood vessels - Formation of Urine- Dialysis Principle of dialysis in artificial kidney - kinds of dialysis.	9
III	Kinetics of Molecules II Adsorption: Adsorption - Factors affecting adsorption - Adsorption of ions by Solids and Liquids - adsorption of Gases by solids - Biological significance of adsorption. Hydrotrophy: Hydrotrophy - Biological importance of hydrotrophy. Precipitation: Precipitation - Biological significance. Colloids: Types of colloids - characteristics of colloids - stability of colloids - Gel - Emulsions - Techniques for the separation of colloids - Biological importance of colloids - Gibb's Donnan Equilibrium	10
IV	Optical Techniques in Biological Studies Characteristics of light- compound microscope - Ultraviolet microscope - Electron microscope Transmission electron microscope - Scanning Electron microscope - Monochromator - Light sensitive detectors- Spectrophotometer - Atomic absorption flame photometer - Electromagnetic radiation Spectroscopy - Ultraviolet, visible, infrared and fluorescent spectroscopy - Atomic absorption and emission spectroscopy - mass spectroscopy - Raman spectroscopy - X-ray diffraction crystallography.	10
V	Bioelectricity and Radiation Biology Membrane potential - Resting membrane potential - Action potential and nerve impulse conduction Rate of nerve impulse conduction- Recording of nerve impulses by C.R.O - Resting membrane potential - Injury potential- Monophasic and diphasic action potentials - Radioactivity - Natural radioactivity Artificial or induced radioactivity - Radioactive disintegration - units of Radioactivity.	10

TEXT BOOKS:

1. Biophysics: Principles and Techniques, M.A. Subramanian, MJP Publishers, (2015).
2. Principles of biophysics, Dr S. Palanichamy, Dr.M. Shanmugavelu, Palani Paramount Publications, (1996).

REFERENCE BOOKS:

1. Biophysics, S. Thiravia Raj, Saras Publication, (2009).
2. Basic Biophysics for Biologist, M. Daniel, Agro-Bios, (1998).

Course Designed by	Verified by HOD	Checked by	Approved by
 (Dr. V. Senthil)	 Dr. B. Appalakrishna		 Co-ordinator
Head of the Department Department of Physics Hindusthan College of Arts & Science Coimbatore-641 028			Curriculum Development Cell Hindusthan College of Arts & Science, Coimbatore-641 028.

Programme Code:	BPH	Programme Title: B.Sc., Physics		
Course Code:	19PHU20B	Course Title	Batch:	2019-2020 Batch Only
		Atomic Physics and Spectroscopy	Semester:	V
Hrs/Week:	4		Credits:	2

Course Objective:

The main objectives of this course are to provide a detailed study of atom, learn the impact of magnetic fields on spectra, study the concept of photo electric cells

Course Outcomes (CO)

K1	CO1	Remember the fundamental principles of X Rays.
K2	CO2	Understand the basic concept of structure of atom.
K2	CO3	Understand the applications of photo electrical cells and X Ray.
K4	CO4	Analyze various types of spectrographs to study about the positive rays.

Mapping of Outcomes

CO \ PO	PO1	PO2	PO3	PO4
CO1	S	S	M	M
CO2	S	S	M	S
CO3	S	M	S	M
CO4	S	M	S	S

S-Strong, M- Medium, L – Low

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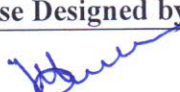
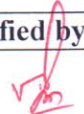

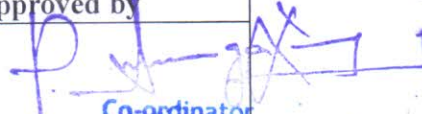
Code No	COURSE	Semester No
19PHU20B	Atomic Physics and Spectroscopy	V
Units	Content	Hours
I	Positive Rays Positive rays – Discovery – Properties – Positive ray analysis – Thomson's Parabola method – action of Electric and Magnetic fields – Determination of e/m – determination of mass – discovery of stable isotopes– Limitations – Dempster's mass spectrograph –Aston's mass spectrograph- mass defect and packing fraction – polarization of X –rays – scattering of X- rays (Thomson's formula).	9
II	Structure of the Atom The Bohr atom model – Critical Potentials – Method of excitation of atoms – Experimental determination of critical potentials by Davison and Goucher's method - Sommerfield's relativistic model– Vector atom model – Quantum numbers associated with Vector atom model – coupling schemes (LS, JJ coupling) – Pauli's exclusion principle – Periodic classification of elements.	9
III	Magneto Optical Properties of Spectrum Magnetic dipole moment due to orbital motion of the electron – Magnetic dipole moment due to spin – The Stern and Gerlach experiment – Optical spectra – Fine Structure of the sodium D line – Zeeman effect– Experiments – Lorentz classical theory – Expression for the Zeeman shift – Larmor's theorem – Quantum mechanical explanation of the normal Zeeman effect – Anomalous Zeeman effect – Paschen – Back effect – Stark effect.	10
IV	Photoelectric Effect Introduction – Richardson and Compton experiment – Relation between Photoelectric current and retarding potentials – Relation between velocity of Photo electrons and the frequency of light – Laws of Photoelectric emission – Failure of electromagnetic theory – Einstein's Photo electric equation – Experimental verification – Millikan's Experiments – Photo electric cells – Photo emissive cell – Photo Voltaic cell – Photo conductive cell – Applications of Photo electric cells.	10
V	X-Ray Spectra X-ray – Coolidge tube – Properties – X-ray Spectra – Continuous and characteristics X-ray spectrum – Mosley's law (Statement, Explanation and Importance) – Compton effect – Expression for change of wave length - X-ray diffraction-Bragg's law- Bragg's spectrometer- Powder crystal method – Quantum theory: The distribution of energy in the spectrum of a black body – its results - Planck's hypothesis – derivation of Planck's law of radiation.	10

TEXT BOOKS:

1. Modern Physics, Murugesan R. and KiruthigaSivaprasath. S. Chand and Company, 18th edition (2016).

REFERENCE BOOKS:

1. Modern Physics, Sehgal D.L. Chopra K.L. and Sehgal N.K. Sultan Chand & Sons, 9th edition, (2004)
2. Atomic Physics, Rajam J B, S. Chand and Company Ltd, New Delhi, 20th edition (2009).

Course Designed by	Verified by HOD	Checked by	Approved by
 (M.S.R. Amirtha Valli)	 COMPTON BABA PRAKASH Head of the Department		 Co-ordinator Curriculum Development Cell Hindusthan College of Arts & Science, Coimbatore-641 028.

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

Programme Code:	BPH	Programme Title: B.Sc., Physics		
Course Code:	19PHU21	Course Title	Batch:	2019-2020 Batch Only
		Thin Films and Nano Technology	Semester:	VI
Hrs/Week:	5		Credits:	4

Course Objective:

To learn the basic concepts of Thin films and properties of nano materials and apply it to various physical problems.

Course Outcomes (CO)

K1	CO1	Remember the fundamental of thin films and nano materials.
K2	CO2	Understand about thin film and nano technology.
K3	CO3	Apply the nano concepts in carbon nano tubes.
K4	CO4	Analyze the synthesis and characterization

Mapping of Outcomes

CO \ PO	PO1	PO2	PO3	PO4
CO1	S	S	M	S
CO2	S	S	M	S
CO3	S	S	S	M
CO4	S	M	S	M

S-Strong, M- Medium, L – Low





Code No	COURSE	Semester No
19PHU21	Thin Films and Nano Technology	VI
Units	Content	Hours
I	Introduction of thin films Introduction to Thin Film, various methods of thin film preparation, their advantages and limitations, evaporation of alloys, compounds and mixtures.	12
II	Fabrication of thin film Nature of thin film, condensation, nucleation and growth of thin films, Determination of structure of thin films, film thickness measurements. Properties & Application of thin films.	12
III	Introduction to nano materials Classifications and types of nanomaterials. Basic understanding of various phenomena at nano scale namely size confinement, interfacial surface phenomena. scope & applications of nanotechnology.	12
IV	Properties of Nano materials Introduction to basic building blocks namely atoms, molecules, self-assembly, carbon nanotubes, nanocrystals, nanoclusters, nanocapsules, fullerenes, quantum dots, quantum wires and nanoporous materials. Functional properties of nanomaterials, Size dependence of material at nano scale. Bulk vs nano properties of materials.	12
V	Synthesis & fabrication techniques 'Top down' vs 'Bottom-up' approach of synthesis. Review of synthesis methods namely sol-gel method, chemical vapour deposition, physical vapour deposition, sputtering, plasma deposition process, mechanical milling. Applications of nanomaterials namely nanograined structural materials & nanocomposites, nanomagnetic materials, chemical applications etc.	12

TEXT BOOKS:

1. Thin film Phenomena, K. L. Chopra, Mc.Graw-Hill Pub. Co. N.Y.
2. Thin film Technology and Applications, K. L. Chopra and L. K. Malhotra, McGrawHill, New York.
3. Nanomaterials: Synthesis, Properties & Applications, ed. by A.S. Edelstein and R.C. Cammarata, published by Institute of Physics, UK.
4. Nanostructured Materials: Processing, Properties and Applications, ed. by C.C. Koch, William Andrew Publishing, New York

REFERENCE BOOKS:

1. Handbook of Thin film Technology, L. T. Maissel and R. Glang, McGraw-Hill, Pub. Co. New York.
2. Active and Passive Thin Film Devices, J. J. Coutts, Academic Press.
3. Nanoparticles and Nanostructured Films: Preparation, characterization & Applications, ed. by J.H. Fendler, John Willey & Sons.
4. Handbook of Nanophase and Nanostructured Materials, ed. by Z.L. Wang, Z. Zhang and Y. Lim, Kluwer Academic Publisher, 2002.
5. Handbook of Nanostructured Materials and Nanotechnology, ed. by H.S. Nalwa, Vol. 1-5, Academic Press.
6. Carbon Nanotubes: Science and Applications ed. by M. Meyyappan, CRC Press, Boca Raton Florida.
7. Processing and Properties of Structural Nanomaterials, Leon L. Shaw, C. Suryanarayana & Rajiv S. Mishra, TMS, 2003.

Course Designed by	Verified by HOD	Checked by	Approved by
 (Mr. N. Suresh)	 (Dr. V. BALAPRAKASH)		 Co-ordinator

Head of the Department
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Curriculum Development Cell
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Programme Code:	BPH	Programme Title: B.Sc., Physics		
Course Code:	19PHU22	Course Title	Batch:	2019-2020 Batch Only
		Biomedical Instrumentation	Semester:	VI
Hrs/Week:	5		Credits:	4

Course Objective:

To learn the origin of bio potentials and different types of electrodes and its placement for various recordings.

Course Outcomes (CO)

K1	CO1	Remember the origin of bio potentials and its propagations.
K2	CO2	Understand different electrode placement for various physiological recordings.
K3	CO3	Design bio amplifier for various physiological recordings.
K4	CO4	Explain various technique for non-electrical physiological measurements.

Mapping of Outcomes

CO \ PO	PO1	PO2	PO3	PO4
CO1	S	M	M	S
CO2	S	S	S	S
CO3	S	M	S	M
CO4	S	M	M	S

S-Strong, M- Medium, L – Low

Code No	COURSE	Semester No
19PHU22	Biomedical Instrumentation	VI
Units	Content	Hours
I	BIO POTENTIAL GENERATION AND ELECTRODES TYPES Origin of bio potential and its propagation. Types of electrodes - surface, needle and micro electrodes and their equivalent circuits. Recording problems - measurement with two electrodes	12
II	BIOSIGNAL CHARACTERISTICS AND ELECTRODECONFIGURATIONS Biosignals characteristics – frequency and amplitude ranges. ECG – Einthoven’s triangle, standard 12 lead system. EEG – 10-20 electrode system, unipolar, bipolar and average mode. EMG– unipolar and bipolar mode..	12
III	SIGNAL CONDITIONING CIRCUITS Need for bio-amplifier - differential bio-amplifier, Impedance matching circuit, isolation amplifiers, Power line interference, Right leg driven ECG amplifier, Band pass filtering	12
IV	MEASUREMENT OF NON-ELECTRICALPARAMETERS Temperature, respiration rate and pulse rate measurements. Blood Pressure: indirect methods - Auscultatory method, direct methods: electronic manometer, Systolic, diastolic pressure, Blood flow and cardiac output measurement: Indicator dilution, and dye dilution method, ultrasound blood flow measurement.	12
V	BIO-CHEMICALMEASUREMENT Blood gas analyzers and Non-Invasive monitoring, colorimeter, Sodium Potassium Analyser, spectrophotometer, blood cell counter, auto analyzer (simplified schematic description).	12

TEXT BOOK:

1. Leslie Cromwell, Biomedical Instrumentation and measurement, 2nd edition, Prentice hall of India, New Delhi, 2015.

REFERENCE BOOKS:

1. John G. Webster, Medical Instrumentation Application and Design, 4th edition, Wiley India Pvt Ltd, New Delhi, 2015.
2. Joseph J. Carr and John M. Brown, Introduction to Biomedical Equipment Technology, Pearson Education, 2004.
3. Myer Kutz, Standard Handbook of Biomedical Engineering and Design, McGraw Hill Publisher, 2003.
4. Khandpur R.S, Handbook of Biomedical Instrumentation, 3rd edition, Tata McGraw-Hill New Delhi, 2014

Course Designed by	Verified by HOD	Checked by	Approved by
(Mrs. 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.

Programme Code:	BPH	Programme Title: B.Sc., Physics		
Course Code:	19PHU23	Course Title	Batch:	2019-2020 Batch Only
		Microprocessors	Semester:	VI
Hrs/Week:	5		Credits:	4

Course Objective:

To enable the students to learn about the Microprocessor Architecture and learn the instruction set of 8085 and to develop the programming skills.

Course Outcomes (CO)

K1	CO1	Remember the 8085 microprocessor architecture and its instruction set.
K2	CO2	Understand the microprocessor Program for various applications.
K3	CO3	Apply Interface the 8085 microprocessor with various peripheral devices.
K4	CO4	Analyze the technique to other microprocessor applications.

Mapping of Outcomes

CO \ PO	PO1	PO2	PO3	PO4
CO1	S	S	M	S
CO2	S	S	S	M
CO3	S	M	S	M
CO4	S	M	S	S

S-Strong, M- Medium, L – Low

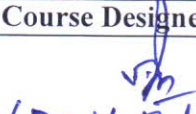
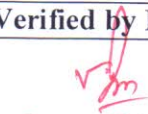

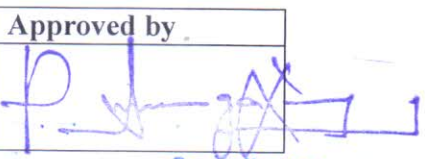
Code No	COURSE	Semester No
19PHU23	Microprocessors	VI
Units	Content	Hours
I	MICROPROCESSOR ARCHITECTURE Microprocessor Architecture and its Operation – Memory Map of 1k Memory Chip – Memory and Instruction Fetch – 8085 Micro Processing Unit – Bus Timing – De-multiplexing the Bus AD ₇ – AD ₀ – Generating Control Signals – Functional Block Diagram of 8085	12
II	TIMINGS AND INSTRUCTION SET Decoding and Execution of an Instruction – 8085 based Microcomputer – Timing of the Memory Write Cycle and Read Cycle – Opcode Fetch Cycle Timing – Instruction Classification – Instruction Format – Addressing modes - Data Transfer Operations – Arithmetic Operations – Logical Operations – Branch Operations – Looping, Counting and Indexing – Addition, Subtraction of 8 and 16 bit Numbers – Time Delay Program	12
III	INTERFACING CONCEPTS Peripherals I/O Instruction – Device Selection and Data Transfer – Input Interfacing – Interfacing I/P using Decoders – Interfacing O/P Display: LED Display – 7 Segments LED Display – Interfacing Memory Bus Contention - Memory Time and Wait States	12
IV	PERIPHERALS The 8255A Programmable Peripherals Interface: Block Diagram of 8255A, Mode 0 Simple I/P O/P BSR Mode, Programming the 8255A in Mode1, Mode 2 – Bidirectional Data Transfer – 8259 Programmable Interrupt Controller – Block diagram of 8253 – Direct Memory Access and 8257 DMA Controller – 8279 Keyboard/Display Interfacing	12
V	APPLICATIONS Applications of Microprocessors - System Requirements - Overall System Design and Software Design - Temperature Monitoring System - Data Acquisition System - Traffic Light Control System - Stepper Motor Control - Digital Clock - Washing Machine Control	12

TEXT BOOKS:

1. Ramesh S Goanker, Microprocessor Architecture Programming and Application with 8085/8080A, IInd Edition, New Age International (P) Ltd
2. Aditya. P. Mathur, Introduction to Microprocessors, IIIrd Edition

REFERENCE BOOKS:

1. S.Malarvizhi, Microprocessor and Its Application, IInd Edition, Anuradha Agencies Publications, March 2006

Course Designed by	Verified by HOD	Checked by	Approved by
 (Dr. V. Bala Prakash)	 (Dr. V. BALA PRAKASH)		

Head of the Department
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Coimbatore-641 028

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

Programme Code:	BPH	Programme Title: B.Sc., Physics		
Course Code:	19PHU24A	Course Title	Batch:	2019-2020 Batch Only
		Optical fiber and Fiber optic Communication system	Semester:	VI
Hrs/Week:	4		Credits:	2

Course Objective:

To enable the students to learn, understand the structures of light sources for optical fiber. optic communication and propagation of light waves in an optical fiber.

Course Outcomes (CO)

K1	CO1	Remember the fiber classification.
K2	CO2	Understand about fiber fabrications.
K3	CO3	Interpret the attenuation and dispersion in an optical fiber.
K4	CO4	Analyze Fiber optic communication systems and Sensors

Mapping of Outcomes

CO \ PO	PO1	PO2	PO3	PO4
CO1	S	S	M	S
CO2	S	S	S	S
CO3	S	M	M	M
CO4	S	M	S	S

S-Strong, M- Medium, L – Low


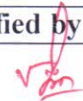

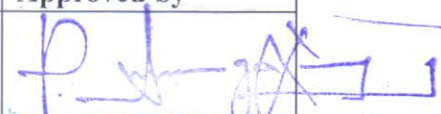
Code No	COURSE	Semester No
19PHU24A	Optical Fiber and Fiber Optic Communication System	VI
Units	Content	Hours
I	Fiber Classification Propagation of light waves in an optical fiber – Acceptance angle and Acceptance cone of a fiber – Numerical Aperture (NA) – Types of optical fiber(material, refractive index mode)- Fibers – classification – stepped index fiber – stepped index singlemode fiber – Graded index multimode fiber – Comparison of step and graded index fibers.	9
II	Fiber Fabrication and Cables Classification of Techniques – External chemical vapour deposition – Characteristics – Internal chemical vapourdeposition – Characteristics – Phasil system Fiber cable construction – losses incurred during installation of cable – Testing of cables – cable selection criteria.	9
III	Fiber Losses and Dispersion in Optics Attenuation in optic fiber – Rayleigh Scattering losses – Absorption losses – Bending losses – Radiation induced losses – Inherent defect losses – Core and Cladding losses. Dispersion in an Optical Fiber – Inter-modal dispersion – Material Chromatic Dispersion – Dispersion Power penalty – Total Dispersion delay.	10
IV	Light Sources For Optical Fibers LED – The process involved in LEDs – Structures of LED – Fiber – LED Coupling – Modulation bandwidth and Spectral Emission of LEDs.	10
V	Fiber optic communication systems and Sensors Fiber optic communication systems-Detectors-Fiber optic sensors-temperature sensor-displacement sensor-pressure sensor-Double crucible techniques of fiber drawing-Splicing-Endoscope	10

TEXT BOOKS:

1. Optical Fibers and Fiber Optic Communication Systems, Subir Kumar Sarkar, S. Chand Limited, (2007)
2. Fiber Optics Communication, D.C.Agarwal, S.Chand (2010)
3. Optical fiber Communication, Keiser, McGraw Hill (2010).

REFERENCE BOOKS:

1. Optical Fibers and Fiber Optic Communication Systems, R.K.Puri and V.K.Babbar, S. Chand & CO
2. Introduction to Fiber Optics, AjoyGhatak, K. Thyagarajan, Cambridge (2009)

Course Designed by	Verified by HOD	Checked by	Approved by
 (Mrs. R. Vishalathi)	 (Conv. B. A. 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.

Programme Code:	BPH	Programme Title: B.Sc., Physics		
Course Code:	19PHU24B	Course Title	Batch:	2019-2020 Batch Only
		Consumer Electronics	Semester:	VI
Hrs/Week:	4		Credits:	2

Course Objective:

To enable the students to learn about the idea implementation of electronics in consumer products.

Course Outcomes (CO)

K1	CO1	Remember the fundamental of auto modeling.
K2	CO2	Understand the working of microwave ovens and air conditions.
K3	CO3	Apply the knowledge on working of calculator.
K4	CO4	Analyze the coding system.

Mapping of Outcomes

CO \ PO	PO1	PO2	PO3	PO4
CO1	S	S	M	S
CO2	S	S	M	S
CO3	S	M	S	M
CO4	M	M	S	S

S-Strong, M- Medium, L – Low

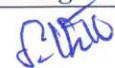



Code No	COURSE	Semester No
19PHU24B	Consumer Electronics	VI
Units	Content	Hours
I	Car Computers Electronic Ignition – Electronic Ignition Lock System – Antilock Braking System (ABS) – Electronically controlled suspension (ECS) – Instrument panel displays – Ultrasonic car safety belt system – Air bag system – Vehicle proximity detection systems – car navigation system.	9
II	Microwave Ovens Microwaves – Properties and generation – Microwave oven block diagram – LCD timer with alarm – Controllers Types of Microwave ovens – Microwave Cooking Safety instructions – Care and Cleaning. Washing Machines: Electronic controller for washing machines – Washing machine hardware and software – Types of washing machines: Fuzzy logic washing machines – Features of washing machines.	9
III	Air Conditioners Air Conditioning: Components of air conditioning systems – All water air conditioning systems – All air conditioning systems – Unitary and central air conditioning systems – Split air conditioners. Refrigerators: Refrigeration – Refrigerants – Refrigeration systems – Domestic refrigerators.	10
IV	Home / Office Digital Devices Facsimile machine – Xerographic copier Calculators – Structure of a calculator – Internal Organization of a calculators – Servicing electronic calculators – Digital clocks – Block diagram of a digital clock.	10
V	Digital Access Devices Bar codes – Bar coding – Bar code scanner and decoder – Automated Teller Machines (ATM): Electronic Funds Transfer – Point of sale Terminal – Automated Teller Machines Set-Top Boxes: Interoperable set– top boxes – Middle ware for set-top boxes – Personal Video Recorder – Digital cable TV – Video on demand.	10

TEXT BOOK:

1. S.P. Bali, "Consumer Electronics", Pearson Education, New Delhi, 2005.

REFERENCE BOOKS:

1. J.S.Chitode, "Consumer Electronics", Technical Publications, 2007.
2. Douglas Kinney, "A Beginners Guide to Consumer Electronics Repair: Hand Book and Tutorial", iUniverse, 2006.
3. Philip Hoff, "Consumer Electronics for Engineers", Cambridge University Press, 1998.

Course Designed by	Verified by HOD	Checked by	Approved by
 (Dr. V. Senthil)	 (Dr. V. BAZAPRAKASH)		 Co-ordinator

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

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

Programme Code:	BPH	Programme Title: B.Sc (Physics)		
Course Code:	19PHU25	Course Title	Batch:	2019-2020 Batch Only
		Practical IV: General Physics II	Semester:	V & VI
Hrs/Week:	3		Credits:	4

Course Objective

1. To learn the physical properties of the materials, semiconducting materials and Laser

K2	CO1	Understand the properties and principles of materials for various applications.
K2	CO2	Understand the behavior of charge carriers in semiconducting materials.
K3	CO3	Analyse the elastic properties of the bulk materials.
K4	CO4	Evaluate the working principle of light experimets in various fields.

Mapping of Outcomes

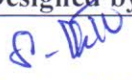
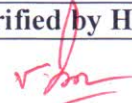


CO \ PO	PO1	PO2	PO3	PO4
CO1	S	S	M	S
CO2	S	S	S	S
CO3	S	M	M	S
CO4	S	M	S	M

S-Strong, M- Medium, L – Low

Code No.	Course	Semester No.
19PHU25	Practical IV: General Physics II	V& VI

(Any 18 Experiments)

1. To study the characteristics of Klystron Tube and to determine its electronic tuning range.
2. Newton's Rings : Radius and Wavelength measurements.
3. Surface Tension by Capillary rise method.
4. Thickness of a given material by Air-wedge method.
5. Determine the band gap of a semiconductor.
6. Wavelength of mercury vapour light – Diffraction grating.
7. Potentiometer – measurement of current, calibration of ammeter.
8. Determination of Plank's constant using photocell and LED.
9. Thermo emf measurement by potentiometer.
10. Viscosity of a given liquid – Mayer's Oscillating disc.
11. Compressibility of liquids – Ultrasonic method.
12. Determination of thickness of wire using LASER.
13. Determination of measurement of the electric charge of a single electron-Millikan oil drop experiment.
14. Determination of very low resistance and specific resistance of different metals - Kelvin's double bridge method.
15. Determination of dielectric constant of a given substance.
16. Determination of Hall coefficient using given semiconductor.
17. Determination of refractive index of given liquid using laser.
18. Characteristics of Laser – Determination of Gaussian nature of laser source and evaluation of beam spot.
19. Fiber loss, numerical aperture and acceptance angle of optical fiber using laser diode.
20. BG – comparison of Capacitance.
21. RC Coupled Amplifier.
22. Emitter follower.
23. DC regulated power supply design.
24. 8-bit addition microprocessor/ microcontroller.
25. UJT Relaxation oscillation.

Course Designed by	Verified by HOD	Checked by	Approved by
 (Dr. V. Senthil)	 DR. V. BALAPRASANTH		 Co-ordinator

Head of the Department
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Coimbatore-641 028

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

Programme Code:	BPH	Programme Title: B.Sc (Physics)		
Course Code:	19PHU26	Course Title	Batch:	2019-2020 Batch Only
		Practical V: C-Programming Lab	Semester:	V & VI
Hrs/Week:	3		Credits:	4

Course Objective

The main objectives of this course are to develop programming concepts in C, apply Programming concepts of C various programmes ,write C programmes for Physics oriented problems.

Course Outcomes (CO)

K1	CO1	Remember the executions in C programming.
K4	CO2	Analyze the programming concepts to solve Physics problems.
K3	CO3	Evaluate the solutions for different Mathematical problems
K4	CO4	Analyse the programming skills in realtime applications.

Mapping of Outcomes

CO \ PO	PO1	PO2	PO3	PO4
CO1	S	S	M	S
CO2	S	S	M	M
CO3	S	M	S	S
CO4	S	M	M	S


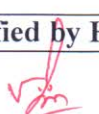
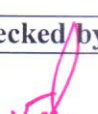
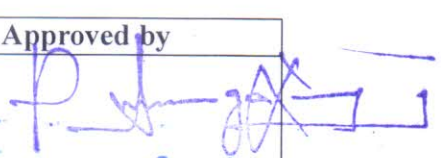
S-Strong, M- Medium, L – Low

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Code No.	Course	Semester No.
19PHU26	Practical V: C-Programming Lab	V & VI

(Any 18 Experiments)

1. Find the sum, average, standard deviation for a given set of numbers.
2. Generate n prime numbers.
3. Generate Fibonacci series.
4. Find the greatest among the Three Numbers.
5. Check Whether the Given Number is Armstrong Number or Not.
6. Find the Sum of Given All Digits.
7. Find the Given Number is Prime or not.
8. Find the given number is odd or even.
9. Matrix Addition, Subtraction and Multiplication.
10. Sort the given set of numbers in ascending order.
11. Check whether the given string is a palindrome or not using Pointers.
12. Count the number of Vowels in the given sentence.
13. Find the factorial of a given number using recursive function.
14. Print the students Mark sheet assuming roll no, name, and marks in five subjects in a structure.
Create an array of structures and print the mark sheet in the university pattern
15. Write a function using pointers to add two matrices.
16. Develop a C program to encrypt and decrypt a string
17. Develop a C program to encrypt and decrypt Files
18. Develop a C program to illustrate recursive function.
19. Develop a C program to find the palindrome in a given sentence
20. Develop a C program to manipulate strings using string functions.
21. Develop a C Program using Functions
22. Develop a C program using the structures.
23. Develop a C program using Array of Structures.
24. Develop a C program to swap two integers using pointers.
25. Develop a C program using Array of Pointers.

Course Designed by	Verified by HOD	Checked by	Approved by
 (Dr. V. Balaprasadh)	 (Dr. V. BALAPRASADH)		 Co-ordinator

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