ST. JOSEPH'S COLLEGE OF ARTS AND SCIENCE
(AUTONOMOUS)
CUDDALORE -1

P.G. AND RESEARCH DEPARTMENT OF PHYSICS

BOARD OF STUDIES –II

a. B.Sc., PHYSICS

SYLLABUS
2021-2022

PG AND RESEARCH DEPARTMENT OF PHYSICS									
CURRICULUM TEMPLATE									
a. B.Sc., Physics									
SEMESTER - I									
S. No	**Part**		**Hours/ Week**	**Credit**	**Course Code**	**Course Title**	**Maximum Marks**		
							CIA	**ESE**	**TOTAL**
1	I	Language -1	4	3	21LT01 / LH101S / LF101	Tamil-I / Hindi-I / French-I	25	75	100
2	II	English - 1	4	3	20LE101	Communicative English – I	25	75	100
3	III	Core Theory - 1	4	3	19PH101	Properties of matter	25	75	100
4	III	Core Theory - 2	4	3	19PH102	Mechanics	25	75	100
5	III	Core Practical - 1	3	2	PHP101	Main Practical – I	40	60	100
6	III	Allied -1	6	4	21AMT11	Allied Mathematics– I	25	75	100
7	III	PE - 1	3	3	20PEPS01	Professional English for Physical Sciences - I	25	75	100
8	IV	SEC - 1	2	2	VE101T	Value Education	25	75	100
Semester Total			**30**	**23**			**215**	**585**	**800**
SEMESTER - II									
S. No	**Part**		**Hours/ Week**	**Credit**	**Course Code**	**Course Title**	**Maximum Marks**		
							CIA	**ESE**	**TOTAL**
9	I	Language -2	4	3	21LT02/ LH202S/ LF202	Tamil-II / Hindi-II / French-II	25	75	100
10	II	English - 2	4	3	20LE202	Communicative English – II	25	75	100
11	III	Core Theory - 3	4	3	19PH203	Thermal Physics	25	75	100
12	III	Core Theory - 4	4	3	19PH204	Waves and Oscillations	25	75	100
13	III	Core Practical - 2	3	2	PHP202	Main Practical – II	40	60	100
14	III	Allied -2	6	4	AMT202T	Allied Mathematics– II	25	75	100
15	III	PE - 2	3	3	20PEPS02	Professional English for Physical Sciences - II	25	75	100
16	IV	SEC - 2	2	2	EPD201T	Dynamics of Personality	25	75	100
Semester Total			**30**	**23**			**215**	**585**	**800**

SEMESTER - III									
S. No	**Part**		**Hours/ Week**	**Credit**	**Course Code**	**Course Title**	**Maximum Marks**		
							CIA	**ESE**	**TOTAL**
17	I	Language -3	4	3	LT303T/ LH303S/ LF303	Tamil-III / Hindi-III / French-III	25	75	100
18	II	English - 3	4	3	20LE303	Communicative English – III	25	75	100
19	III	Core Theory - 5	4	3	19PH305	Electricity and Magnetism	25	75	100
20	III	Core Theory - 6	4	3	19PH306	Basic Electronics	25	75	100
21	III	Core Practical - 3	3	2	PHP303	Core Practical – III	40	60	100
22	III	Allied -3	5	3	ACH301S	Allied Chemistry	25	75	100
23	III	Allied Practical - 1	3	2	ACHP301	Allied Chemistry Practical	40	60	100
24	IV	SEC - 1	3	2	EVS301S	Environmental Science	25	75	100
Semester Total			**30**	**21**			**230**	**570**	**800**
SEMESTER - IV									
S. No	**Part**		**Hours/ Week**	**Credit**	**Course Code**	**Course Title**	**Maximum Marks**		
							CIA	**ESE**	**TOTAL**
25	I	Language -4	4	3	LT404T/ LH404S/ LF404	Tamil-IV / Hind-IV / French-IV	25	75	100
26	II	English - 4	4	3	20LE404	Communicative English – IV	25	75	100
27	III	Core Theory - 7	4	3	19PH407	Atomic Physics	25	75	100
28	III	Core Theory - 8	4	3	19PH408	Applied Electronics	25	75	100
29	III	Core Practical - 4	4	3	PHP404	Core Practical – IV	40	60	100
30	III	Allied - 4	5	3	19ABC401	Biophysics	25	75	100
31	III	Allied Practical-2	2	2	19ABP401	Biophysics Practical	40	60	100
32	IV	SEC - 3	3	2	AOBM401	Business organization and Management	25	75	100
Semester Total			**30**	**22**			**230**	**570**	**800**

SEMESTER – V									
S. No	**Part**		**Hours/ Week**	**Credit**	**Course Code**	**Course Title**	**Maximum Marks**		
							CIA	**ESE**	**TOTAL**
33	III	Core Theory - 9	5	5	19PH509	Optics & Spectroscopy	25	75	100
34	III	Core Theory - 10	5	5	19PH510	Solid state Physics	25	75	100
35	III	Core Theory - 11	5	4	19PH511	Digital Electronics	25	75	100
36	III	Elective - 1	4	3	19EPH51A	Electrical Wiring	25	75	100
					19EPH51B	Numerical Methods & basic computer programming			
37	III	Elective - 2	5	3	19EPH52A	Geophysics	25	75	100
					19EPH52B	Fiber Optic Communication			
38	III	Core Practical - 5	6	4	PHP505	Main Practical – V	40	60	100
Semester Total			**30**	**24**			**165**	**435**	**600**
SEMESTER - VI									
S. No	**Part**		**Hours/ Week**	**Credit**	**Course Code**	**Course Title**	**Maximum Marks**		
							CIA	**ESE**	**TOTAL**
39	III	Core Theory - 12	5	5	21PH612	Relativity & Quantum Mechanics	25	75	100
40	III	Core Theory - 13	5	5	19PH613	Nuclear & Radiation Physics	25	75	100
41	III	Core Theory - 14	5	4	19PH614	Astrophysics	25	75	100
42	III	Elective - 3	4	3	19EPH63A	Basic Computation for Physics	25	75	100
					19EPH63B	Energy Physics			
43	III	Core Practical – 6	6	4	PHP606	Main Practical – VI	40	60	100
44	III	Core Practical - 7	5	3	JPH601	Project	-	100	100
Semester Total			**30**	**24**			**140**	**460**	**600**

Extra Credit Course					
S.No	**Semester**	**PART**	**Credit**	**Course Code**	**Course Title**
1	II	VI	1	21PHF201	Field Visit / Field Project
2	IV	VI	1	21PHI401	Internship
3	V	VI	Credits will be transferred		SWAYAM/NPTEL
4	V	VI	2	19SSPH52	Physics in everyday life
5	VI	V	2	EU601	Extension activities

Courses Offered to other Departments									
SEMESTER - III									
S.No	**Part**		**Hours/ Week**	**Credit**	**Course Code**	**Course Title**	**Maximum Marks**		
							CIA	**ESE**	**TOTAL**
1	III	Allied	5	4	APH301	Allied Physics	25	75	100
SEMESTER - IV									
2	IV	Allied	5	4	APH401	Allied Physics	25	75	100

I B.Sc (PH)	PROPERTI ES OF MATTER	19PH101
SEMESTER - I		HRS/WK - 4
CORE -1		CREDIT - 3

OBJECTIVE:

To know about the various properties of solids and liquids.

COURSE OUTCOMES (CO):

At the end of the Course the students should be able to exhibit

CO1: Learn the basics of elasticity and its importance in beams

CO2: Study the concepts of Elasticity and the various methods to determine the parameters experimentally

CO3: Acquire Knowledge of bending of beams

CO4: Be familiar with the surface tension

CO5: Study the concepts of viscosity and surface tension and the various methods to determine the parameters experimentally

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER - I	COURSE CODE: 19PH101					COURSE TITLE: PROPERTIES OF MATTER						Hours: 4	Credits: 3
Course Outcomes Cos	Programme Outcomes POs					Programme Specific Outcomes PSOs						Mean Score of CO's	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6		
CO1	4	3.8	4	3.5	3.5	3.8	3.5	3	4	3	4	3.65	
CO2	3.5	3	3.5	3	3.5	4	4	4	4	3	4	3.59	
CO3	3	3.5	3	4	3.5	3	3	3.5	4	3.5	3	3.36	
CO4	3	4	4	3	2	3.5	3.5	3.5	3.5	4	2.5	3.32	
CO5	4	4	4	3.5	4	4	3.5	4	4	3.5	2.5	3.73	
Mean Overall Score												3.53	

Result: The Score for this course is 3.53 (High)

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High
Value Scaling					
Mean Score of COs= $\frac{Total\ Values}{Total\ No.of\ POs\ \&\ PSOs}$			Mean Overall Score of COs= $\frac{Total\ Mean\ Scores}{Total\ No.of\ COs}$		

This course is having **High** association with Programme Outcome and Programme Specific Outcome

UNIT- I **(12 Hours)**

Elasticity-I: Hooke's law – stress – strain diagram – Modulus of elasticity - Relation between elastic constants – Poisson's ratio- Expressions for Poisson's ration in terms of elastic constants – work done in stretching of a wire and twisting a wire.

UNIT- II **(12 Hours)**

Elasticity-II: Twisting couple on a cylinder – Torsional pendulum without mass– Rigidity modulus and moment of inertia – Rigidity modulus by static torsion - q, n and σ by Searle's method

UNIT- III **(12 Hours)**

Bending Of Beams: Bending moment-Expression for Bending moment-Cantilever-Expression for depression at the loaded end of a cantilever-Experiment to determine Young's modulus by Cantilever depression(Pin and Microscope)- Non-Uniform bending-Expression for depression at the midpoint of a beam subjected to Non uniform bending- Experiment to determine Young's modulus by Non uniform bending (using pin & microscope)-Uniform bending- Expression for elevation at the midpoint of a beam subjected to Uniform bending(using pin & microscope).

UNIT- IV **(12 Hours)**

Surface Tension: Molecular Interpretation - dimensions of surface tension – Excess of pressure over curved surfaces – Application to spherical and cylindrical drops and bubbles – Variation of surface tension with temperature – Jaeger's method.

UNIT- V **(12 Hours)**

Viscosity: Co-efficient of viscosity and its dimensions – Rate of flow of liquid in a capillary tube – Poiseuille's formula – Experiment to determine co-efficient of viscosity of a liquid(Constant volume method) – variation of viscosity of a liquid with temperature and pressure.

TEXT BOOKS:

1. BrijLal, N. Subrahmanyam, Properties of Matter, S. Chand Publications, 2002.
2. Murugeshan .R, Properties of Matter and Acoustics, New Delhi, S. Chand & Co, 2006.

REFERENCE BOOKS:

1. C.L. Arora, P.S. Hemine., Physics for Degree students. First B.Sc Physics, 2010.
2. Mathur D.S., Elements of Properties of matter, S. Chand, 2006.

I B.Sc (PH)	MECHANICS	19PH102
SEMESTER - I		HRS/WK - 4
CORE -II		CREDIT - 3

OBJECTIVE:

To understand the basics of gravity, rigid bodies, space science and mechanism of particles.

COURSE OUTCOMES:

At the end of the Course the students should be able to exhibit

CO1: Understand the basic ideas of Centre of Gravity, Centre of Pressure and Fluid dynamics.

CO2: Understand the various concepts of mechanics involved in Rigid bodies.

CO3: Acquire the concepts of space science

CO4: Acquire the knowledge about the projectile and friction

CO5: Apply the knowledge to the mechanism of system of particles.

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER - I	COURSE CODE: 19PH102					COURSE TITLE: MECHANICS						Hours: 4	Credits: 3
Course Outcomes Cos	Programme Outcomes POs					Programme Specific Outcomes PSOs						Mean Score of CO's	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6		
CO1	4	4	3.5	4	3.8	3.5	3	3.5	3.5	3.5	3	3.57	
CO2	2.5	4	3	4	4	3.5	3.5	3.5	4	4	3.5	3.59	
CO3	3.5	3.5	4	3.5	3.5	3.5	4	4	3.5	3	3.5	3.59	
CO4	3	4.5	3.5	4	3.5	4	3	3	3.5	4	3.5	3.59	
CO5	3	4	2.5	4	4	4	3.5	3.5	4	3.5	4	3.64	
Mean Overall Score												3.60	

Result: The Score for this course is 3.60 (High)

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High
Value Scaling					
Mean Score of COs= $\frac{Total\ Values}{Total\ No.of\ POs\ \&\ PSOs}$			Mean Overall Score of COs= $\frac{Total\ Mean\ Scores}{Total\ No.of\ COs}$		

This course is having **High** association with Programme Outcome and Programme Specific Outcome

UNIT - I **(12 Hours)**

Statics, Hydrostatics and Fluid Mechanics: Centre of gravity- Centre of gravity of a Solid cone- Centre of gravity of a Solid hemisphere-Thrust-Centre of pressure- Vertical rectangular lamina.

Equation of continuity of flow- Energy of the fluid- Euler's Equation of unidirectional flow -Bernoulli's theorem

UNIT - II **(12 Hours)**

Mechanics Of Rigid Bodies: Rigid body- Moment of inertia- Radius of gyration- moment of inertia of a solid cylinder, cylindrical shell, solid sphere, spherical shell - Bifilar pendulum-Compound pendulum-Determination of g and k.

UNIT - III **(12 Hours)**

Space Science: Rockets and satellites- Basic principles of rocket motion - Rocket equation, Thrust and acceleration- Escape velocity of multistage rockets. Liquid, solid and cryogenic propellant rockets- Space shuttle- Orbital velocity- Launching of satellites - Types of satellite Orbits.

UNIT - IV **(12 Hours)**

Projectiles and Friction: Introduction to projectile motion-Projectile on an inclined plane - Friction- Laws of friction- Sliding friction - Angle of friction- Cone of friction- Equilibrium of a body on a rough inclined plane acted upon by an external force- Rolling friction and stability.

UNIT - V **(12 Hours)**

Mechanics Of A System Of Particles: Generalized Co-ordinates- transformation equations-configuration space- principle of Virtual work- D' Alembert's principle- Lagrange's equations and its applications.

TEXT BOOKS:

1. Murugeshan, Mechanics and Mathematical Methods, S.Chand and Co., 2005.
2. Gupta Kumar and sharma, Classical Mechanics, Pragati Prakashan, 2001.
3. C.L. Arora, Mechanics, S. Chand Publishing, 2014.

REFERENCE BOOKS:

1. Feynmann R.P, Leighton R.B and Sands M,The Feynmann Lectures on Physics, Vols 1, 2 and 3, Narosa, New Delhi, 1998.
2. Brijlal and Subramaniyam, Mechanics and Electrodynamics, S. Chand, Kindle Edition, 2005.

I B.Sc (PH)	PRACTICAL – I	PHP101
SEMESTER – I		HRS/WK – 3
CORE – PRACTICAL - 1		CREDIT – 2

(Any nine out of the given 12 experiments**)**

1. Young's Modulus by Non-Uniform Bending – Pin and Microscope
2. Young's Modulus by Non-Uniform Bending – Optic Lever.
3. Rigidity modulus- Torsional Pendulum – n of a wire (without masses)
4. Rigidity modulus -Torsional Pendulum – n (with masses)
5. Sonometer – Determination of Frequency of tuning fork.
6. Sonometer – Determination of Specific Gravity of Solid and Liquid.
7. Surface tension by drop weight and Interfacial liquid– Drop Weight Method.
8. Comparison of Viscosity of two liquids
9. Focal Length and Refractive Index of Convex Lens (u-v method and conjugate foci methods for 'f' and Boy's method for R).
10. Spectrometer – μ of the hollow Prism
11. Potentiometer – Calibration of low range voltmeter.
12. Rigidity modulus by Static Torsion (mirror and telescope method).

I B.Sc (PH)	THERMAL PHYSICS	19PH203
SEMESTER – II		HRS/WK – 4
CORE – III		CREDIT –3

OBJECTIVE:

To understand the basics of heat transmission, kinetic theory of gases and working of low temperature devices.

COURSE OUTCOMES:

At the end of the Course the students should be able to exhibit

CO1: Acquire knowledge of methods of heat transmission, different types of Heat engines and Entropy

CO2: Understand the nature and the kinetic theory of gases

CO3: Understand the different methods of liquefaction of gases.

CO4: Study the concepts of low temperature physics, refrigeration and air conditioning.

CO5: Understand the concepts of latent heat and its effect on boiling point and melting point and the significance of Maxwell's thermodynamical relations

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER - II	COURSE CODE: 19PH203					COURSE TITLE: THERMAL PHYSICS						Hours: 4	Credit: 3
Course Outcomes COs	Programme Outcomes POs					Programme Specific Outcomes PSOs						Mean Score of CO's	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6		
CO1	4	3.5	4	3.5	4	3.5	4	4	3.5	3.5	3.5	3.73	
CO2	3.5	4	4	3.5	4	3.5	4	3.5	4	3.5	2.5	3.64	
CO3	4	4	3.5	4	3.5	4	3	3.5	3.5	3.5	4	3.68	
CO4	3	4	3.5	4	3.5	4	4	3.5	3.5	3.5	4	3.68	
CO5	4	4	3.5	3.5	4	4	3.5	4	3.5	3	3.5	3.68	
Mean Overall Score												3.68	

Result: The Score for this course is 3.68 (High)

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High
Value Scaling					
Mean Score of COs= $\frac{Total\ Values}{Total\ No.of\ POs\ \&\ PSOs}$			Mean Overall Score of COs= $\frac{Total\ Mean\ Scores}{Total\ No.of\ COs}$		

This course is having **High** association with Programme Outcome and Programme Specific Outcome

UNIT- I **(12 Hours)**

Heat and Thermodynamics: Heat: C_P, C_V and γ of a gas- Mayer's relation- Basics of Heat transfer: Conduction, Convection, Radiation- Mechanical equivalent of Heat.

Thermodynamics: Reversible and irreversible processes – Heat engines – Otto and diesel engines – thermodynamic scale of temperature - entropy - change of entropy in reversible and irreversible processes – T-S diagram– entropy for a perfect gas - third law of thermodynamics

UNIT- II **(12 Hours)**

Kinetic Theory Of Gases: Expression for pressure **-** Transport phenomenon – expression for mean free path - thermal conductivity and diffusion of gases - distribution of molecular velocities – energy distribution function - Degrees of freedom - equipartition law of energy.

UNIT- III **(12 Hours)**

Adiabatic and Isothermal Changes and Liquefaction Of Gases: Reversible adiabatic and isothermal changes– equations – Clement and Desormes method of determining C_p / C_v – Andrew's work on Co_2– regenerative cooling – the Linde process – Liquefaction of air and hydrogen-KamerlinghOnnes Cascade method for Liquefying Oxygen.

UNIT- IV **(12 Hours)**

Low Temperature Physics: Helium – He I and He II – super fluidity - practical applications of low temperatures – refrigerating machines– electroflux refrigerator – Frigidaire – air conditioning machines – effects of CF_2 and Cl_2 on Ozone layer

UNIT- V **(12 Hours)**

Phase Transition: First Latent heat equation (Clausius – Clapeyron equation), effect of pressure on melting and boiling point – second Latent heat equation - Maxwell's Thermodynamical relations–derivations.

TEXT BOOKS:

1. Mathur D.S., Heat and Thermodynamics, S. Chand, 2014.
2. Narayanamoorthy Nand Nagarathinam N, Heat, National publishing Co, Chennai, Eight Edition, 1987.
3. Murugeshan.R., Thermal Physics., S. Chand & Co., 2009.
4. Brijlal and Subramanyam, Heat and Thermodynamics, S. Chand & Co., 2000.

REFERENCE BOOKS:

1. Nelkon Parker, Advanced Level Physics, (Vol.V), Arnold Publication, Berkely Series, 1995.

2. Dr. Ilangovan and Dr.D. Jayaraman,, Thermal Physics, S. Chand & Co., 2014.

I B.Sc (PH)	WAVES AND OSCILLATIONS	19PH204
SEMESTER – II		HRS/WK - 4
CORE – 1V		CREDIT - 3

OBJECTIVE:

Know about the basics of Simple Harmonic Motion, Doppler effect and production and detection of Ultrasonics.

COURSE OUTCOMES:

At the end of the Course the students should be able to exhibit

CO1: Acquire knowledge of Simple Harmonic Motion

CO2: Understand the character of Transverse waves

CO3: Understand the character of longitudinal waves and Doppler effect

CO4: Acquire the knowledge of production, detection and applications of Ultrasonics

CO5: Acquire knowledge of Acoustics.

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER - II	COURSE CODE: 19PH204					COURSE TITLE: WAVES AND OSCILLATIONS					Hours: 4	Credits: 3
Course Outcomes COs	Programme Outcomes POs					Programme Specific Outcomes PSOs						Mean Score of CO's
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1	4	4	3.5	4	3.5	4	4	3.5	3.5	4	3.5	3.77
CO2	3.5	3.5	3.5	4	4	3.5	4	3.5	4	4	4	3.77
CO3	4	4	4	3.5	4	3.5	3.5	3.5	3.5	4	4	3.77
CO4	4	3.5	3.5	3.5	3.5	3	2.5	4	4	3.5	4	3.55
CO5	3.5	4	3.5	4	3.5	3.5	4	4	3.5	3.5	3.5	3.68
Mean Overall Score												3.71

Result: The Score for this course is 3.71 (High)

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High
Value Scaling					
Mean Score of COs= $\frac{Total\ Values}{Total\ No.of\ POs\ \&\ PSOs}$			Mean Overall Score of COs= $\frac{Total\ Mean\ Scores}{Total\ No.of\ COs}$		

This course is having **High** association with Programme Outcome and Programme Specific Outcome

UNIT – I **(12 Hours)**

Simple Harmonic Motion: Simple harmonic motion– Velocity and acceleration in SHM – Energy of a simple harmonic oscillator (LC) –Examples of simple harmonic oscillators in electrical systems – Superposition of two SHMs of Equal time periods and acting at right angles to each other - Lissajous figures –Damped harmonic oscillations.

UNIT – II

Transverse Waves: Introduction to transverse waves – Velocity of transverse waves in stretched string – Standing waves on a string-Determination of AC frequency using Sonometer (Steel wire) – Energy of a vibrating string – Standing wave ratio.

UNIT - III **(12 Hours)**

Longitudinal Waves: Introduction to longitudinal waves – Sound waves in gases – Energy distribution in sound waves – Intensity of sound waves – Longitudinal waves in a solid – Example: earthquake – Doppler Effect.

UNIT – IV **(12 Hours)**

Ultrasonics: Ultrasonics – Production of Ultrasonics: Piezo electric effect- Piezo electric crystal generator –Magnetostriction generator –Detection of ultrasonics –Thermal detectors – Piezo electric detectors - Applications of Ultrasonics- Ultrasound scan – NDT.

UNIT – V **(12 Hours)**

Acoustics: Reflection and transmission of sound waves at boundaries – Diffraction of sound waves- Noise and music – Limits of human audibility – The decibel unit- Reverberation time- Sabine's formula for growth and decay – Acoustics of auditoriums and halls– Introduction to acoustic transducers.

TEXT BOOKS:

1. H. J. Pain, ThePhysics of Vibrations and Waves, John Wiley, (2005), 6th Edition, for Units I, II & III.
2. N. Subrahmanyam, Brijlal, A Text Book of Sound, Second Edition, Vikas Publishing house PVT Ltd, 2016.

REFERENCE BOOKS:

1. David Halliday, Robert Resnick and Jearl Walker, Fundamentals of Physics, John Wiley & Sons(2004), 7th Edition.
2. Lawrence E. Kinsler, Austin R. Frey, Alan B. Coppens and James V. Sanders, Fundamentals ofAcoustics, John Wiley, (2000).
3. Richard P. Feynman, Robert B. Leighton, Matthew Sands, Feynman Lectures on Physics: TheDefinitive and Extended Edition. Addison-Wesley, (2005), 2nd Edition.

I B.Sc (PH)	PRACTICAL – II	PHP202
SEMESTER - II		HRS/WK - 3
CORE – PRACTICAL - II		CREDIT - 2

(Any nine out of the given 12 experiments**)**

1. Young's Modulus by Uniform Bending – Pin and Microscope
2. Young's Modulus by Uniform Bending – Optic Lever.
3. Thermal Conductivity of the Bad Conductor – Lee's Disc Method.
4. Specific heat capacity of liquid by method of mixtures (Half-time Correction).
5. Specific heat capacity of liquid by Newton's Law of cooling.
6. Spectrometer i–d Curve.
7. Focal Length R &μ of a concave lens.
8. Potentiometer – Calibration of an Ammeter.
9. Sonometer – Comparison of Linear Densities
10. Air wedge thickness of a wire
11. M and B_H – TanC – Deflection and vibration Magnetometer.
12. Figure of merit of a table galvanometer.

II B.Sc (PH)	ELECTRICITY AND MAGNETISM	19PH305
SEMESTER - III		HRS/WK - 4
CORE - V		CREDIT - 3

OBJECTIVE:

Understand the concepts of Electrostatic laws, growth and decay of charge in DC circuit.

COURSE OUTCOMES:

At the end of the Course the students should be able to exhibit

CO1: Understand the concepts of Electrostatics and the laws associated with them.

CO2: Acquire knowledge of current electricity and thermoelectricity

CO3: Understand the growth and decay of charge and current in DC circuits.

CO4: Understand the basics of AC and Electromagnetic induction

CO5: Understand the concepts of magnetic properties of materials

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER - III	COURSE CODE: 19PH305					COURSE TITLE: ELECTRICITY AND MAGNETISM						Hours: 4	Credits: 3
Course Outcomes COs	Programme Outcomes POs					Programme Specific Outcomes PSOs						Mean Score of CO's	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6		
CO1	4.5	4.8	4	4.5	4	4	4.2	3.5	4	4.5	4	4.18	
CO2	3	3.5	4	4.5	4	4	4	4	3.5	4	2.5	3.73	
CO3	4	4	4.5	3.5	4	3.5	3	3	3.5	4	3.5	3.68	
CO4	3.5	3	3	3.5	4	4.5	4	4	3.5	3	3.5	3.59	
CO5	4	3	3	3.5	3	3	3.5	3.2	3	3	3	3.15	
Mean Overall Score												3.68	

Result: The Score for this course is 3.68 (High)

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High
Value Scaling					
Mean Score of COs= $\frac{Total\ Values}{Total\ No.of\ POs\ \&\ PSOs}$			Mean Overall Score of COs= $\frac{Total\ Mean\ Scores}{Total\ No.of\ COs}$		

This course is having **High** association with Programme Outcome and Programme Specific Outcome

UNIT- I **(12 Hours)**

Electrostatics: Coulomb's law – electric intensity and electric potential – electrical images (any four examples) - electric intensity and potential due to an earthed conducting sphere applying the principle of electrical images-capacity – capacitance of a spherical and cylindrical capacitor – energy of a charged capacitor – loss of energy due to sharing of charges

UNIT- II **(12 Hours)**

Current Electricity: Carey foster bridge - theory – Determination temperature co-efficient of resistance – Calibration of voltmeter – Ammeter - Using Potentiometer - thermoelectricity- Peltier's coefficient – Thomson coefficient – application of thermodynamics to a thermocouple and connected relations- thermoelectric diagram and uses.

UNIT- III **(12 Hours)**

Transient Current: 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.

UNIT- IV **(12 Hours)**

A.C and Electromagnetic Induction: Power in AC circuit – wattless current- choke coil - construction and working of transformers- energy losses -single phase, and three phase AC – star and delta connection –electric fuses- circuit breakers.Self Inductance-Mutual Inductance-Inductances in series and parallel-Self-inductance of co-axial cylinders.

UNIT-V **(12 Hours)**

Magnetic Properties of Materials: Susceptibility- permeability- intensity of magnetization and the relation B= u(H+M), M-H and B-H curves for a magnetic material using magnetometer method and ballistic galvanometer method – Terrestrial magnetism – magnetic elements- dip circle.

TEXT BOOKS:

1. Murugeshan R, Electricity and Magnetism, 8th Edition, New Delhi, S. Chand & Co., 2006.
2. Brijlal and N. Subramanian, Electricity and Magnetism, 6th Edition, Agra, Ratan& PrakashNarayanamoorthy M, Nagarathnam N, Electricity and Magnetism, 4th edition, Meerut, National Publishing Co.
3. Arora C.L., Electricity and Magnetism, S. Chand Publishing, 2014.

REFERENCE BOOKS:

1. David J Griffith, Introduction to Electrodynamics, 2nd Edition, New Delhi, Prentice Hall of India Pvt. Ltd, 1997.
2. Sehgal D.L, Chopra K. L and Sehgal N. K, Electricity and Magnetism, New Delhi, Sultan Chand & Co.,

II B.Sc (PH)	BASIC ELECTRONICS	19PH306
SEMESTER – III		HRS/WK - 4
CORE - VI		CREDIT - 3

OBJECTIVE:

Understand the working of diode, transistors and oscillators and it applications

COURSE OUTCOMES:

At the end of the Course the students should be able to exhibit

CO1: Understand the concept of Diodes and its characteristics

CO2: Understand the characteristics of transistors

CO3: Acquire the knowledge of various oscillators

CO4: Understand the wave shaping circuits and multi vibrators

CO5: Acquire the knowledge of various applications of electronics

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER - III	COURSE CODE: 19PH306					COURSE TITLE: BASIC ELECTRONICS					Hours: 4	Credits: 3
Course Outcomes COs	Programme Outcomes POs					Programme Specific Outcomes PSOs						Mean Score of CO's
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1	4	3.5	3.5	3.5	4	3.5	4	4	3	3	3	3.55
CO2	4	3.5	2.5	4	3.5	4	3.5	3.5	3	3	4	3.50
CO3	3.5	4	3.5	4	4	4	4.5	3.5	3.5	3.5	3.5	3.77
CO4	3.5	3.5	4	3.5	4	3.5	4	4	3	3.5	3.5	3.64
CO5	4	4	4	4	3.5	3	4	3.5	3	3.5	3.5	3.64
Mean Overall Score												3.62

Result: The Score for this course is 3.62 (High)

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High
Value Scaling					
Mean Score of COs= $\frac{Total\ Values}{Total\ No.of\ POs\ \&\ PSOs}$			Mean Overall Score of COs= $\frac{Total\ Mean\ Scores}{Total\ No.of\ COs}$		

This course is having **High** association with Programme Outcome and Programme Specific Outcome

UNIT – I **(12 Hours)**

Diodes and Its Applications: PN junction diode - Half-wave, full-wave and bridge rectifier – expression for efficiency and ripple factor – π section filter – Zener diode –Zenerregulated power supply

UNIT –II **(12 Hours)**

Transistor Biasing And Transistor Amplifiers: Different modes of operation –biasing and characteristics of a transistor in CE mode-h Parameters of CE mode- α and β of a transistor – Potential divider bias-Double stage RC coupled amplifier – frequency response curve– classification of amplifiers – class A power amplifier – Push-pull, class B power amplifier – Emitter follower.

UNIT –III **(12 Hours)**

Oscillators: Voltage gain of a feedback amplifier – Barkhausen criterion – Hartley, Colpitt's, and Phase shift oscillators– expression for frequency of oscillations and condition for sustained oscillations in each case– frequency stability.

UNIT –IV **(12 Hours)**

Wave Shaping Circuits and Multi Vibrators: Clipping and clamping circuits – integrating and differentiating circuits – RC time constants. Multivibrators – Astable, – Mono stable and bi-stable multivibrators – Schmitt trigger

UNIT –V **(12 Hours)**

Testing Electronic Components: Testing various cables, connectors and fuses (Continuity test using multimeter)- Identifying, finding values and testing different types of resistors and Capacitors(by colour codes & multimeter)-Identifying (leads & type) and Testing Diodes, Zener diodes and Transistors(using multimeter) -Testing IC's.

TEXT BOOKS:

1. B.L. Theraja, Electronics, S. Chand Publishing, 2005.
2. V. K Mehta, Principles of Electronics, S. Chand & Co., 2005.
3. M. Arul Thalapathi, Basic and Applied Electronics, Comtek publisher, 2005.

REFERENCE BOOKS:

1. A. Malvino, Electronics Principles, McGraw Hill Education, 7th Edition, 2006.
2. Allen Mottershed, Electronic Devices and Circuits, Goodyear Pub. Co., 1973.
3. R.S. Sedha, Applied Electronics,S. Chand & Company Ltd; 2nd New Edition, 2000.

II B.Sc (PH)	**Practical - III**	**PHP303**
SEMESTER – III		**HRS/WK - 3**
CORE – PRACTICAL – III		**CREDIT - 2**

(Any nine out of the given 12 experiments**)**

1. Compound Pendulum
2. Bifilar Pendulum
3. Field along the axis of Circular Coil - B_H
4. Young's modulus- Cantilever oscillations (Dynamic method) -Pin and microscope.
5. Young's modulus-Cantilever Depression - scale and telescope
6. Sonometer-ac frequency using steel wire
7. Sonometer-ac frequency using brass wire
8. Spectrometer-grating-normal incidence method
9. Spectrometer-grating-minimum deviation method
10. Surface Tension of the Liquid – Capillary Rise Method
11. Young's Modulus by Koenig's method(Non-Uniform Bending)
12. Potentiometer- Resistance- Specific Resistance of a wire

II B.Sc (PH)	ATOMIC PHYSICS	19PH407
SEMESTER – IV		HRS/WK - 4
CORE -VII		CREDIT - 3

OBJECTIVE:

Understand the working of discharge phenomenon of gases, atomic structure, production and properties of X-rays.

COURSE OUTCOMES:

At the end of the Course the students should be able to exhibit

CO1: Acquire knowledge through discharge phenomenon through gases

CO2: Get the basic knowledge of atomic structure

CO3: Acquire knowledge ionization potential and splitting of energy levels

CO4: Understand the concept of photo electricity and verifications by experiments.

CO5: Understand the production and properties of X-rays.

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER - IV	COURSE CODE: 19PH407					COURSE TITLE: ATOMIC PHYSICS						Hours :4	Credits : 3
Course Outcomes COs	Programme Outcomes POs					Programme Specific Outcomes PSOs						Mean Score of CO's	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6		
CO1	3	3.5	3	3.2	3.5	4	3	3	3.5	3.5	4	3.38	
CO2	4	4	3.5	4	4	4	2.5	3.5	4	3.5	4	3.73	
CO3	4	3.5	4	3.5	3	3.5	4	4	4	3	3.5	3.64	
CO4	3.5	3.5	4	3.5	3.5	3.5	4	3.5	3.5	3.5	3.5	3.59	
CO5	4	4	3.5	3.5	4	4	3.5	4	4	3.5	3	3.73	
Mean Overall Score												3.61	

Result: The Score for this course is 3.61 (High)

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High
Value Scaling					
Mean Score of COs= $\frac{Total\ Values}{Total\ No.of\ POs\ \&\ PSOs}$			Mean Overall Score of COs= $\frac{Total\ Mean Scores}{Total\ No.of\ COs}$		

This course is having **High** association with Programme Outcome and Programme Specific Outcome

UNIT-I **(12 Hours)**

Discharge Phenomenon through Gases: Motion of a charge in transverse electric and magnetic fields – specific charge of electron – Dunnington's method – Magnetron method – positive rays – Thompson parabola method – Aston and Dempster's mass spectrograph

UNIT-II **(12 Hours)**

Atomic Structure: Vector atom model – Pauli's exclusion principle – explanation of periodic table – various quantum numbers – angular momentum and magnetic moment – coupling schemes – LS and JJ coupling – spatial quantization – Bohr magnetron Spectral terms and notations – selection rules – intensity rule and interval rule.

UNIT-III **(12 Hours)**

Ionisation Potential and Splitting of Energy Levels: Excitation and ionization potential – Davis and Goucher's method – Zeeman effect – Larmor's theorem – Debye's explanation of normal Zeeman effect – Anomalous Zeeman effect – theoretical explanation- Lande's 'g' factor and explanation of splitting of D1 and D2 lines of sodium – Paschen Back effect – theory – Stark effect (Qualitative treatment only)

UNIT-IV **(12 Hours)**

Photoelectricity: Photo electricity: Photoelectric emission laws – Lenard's experiment- Richardson and Compton experiment- Einstein photoelectric equation -experimental verification of Einstein's photoelectric equations by Millikan's experiment.

UNIT-V **(12 Hours)**

X-Rays: Continuous and characteristic X-RAY spectra absorption of X-RAYS by matter-concept of reciprocal lattice, Compton effect-derivation of expression for change in wavelength-experimental verification

TEXTBOOKS:

1. R. Murugeshan, Modern Physics, S. Chand & Co., New Delhi, 2009.
2. N. Subramanian and BrijLal, Atomic and Nuclear Physics, S. Chand & Co., 2013.

REFERENCE BOOKS:

1. A. B. Gupta and Dipak Ghosh, Atomic Physics, Books and Allied Publishers, 2nd Edition, 2009.
2. D. Halliday, R. Resnick and J. Walker, Fundamentals of Physics, Willey NY, 6th Edition, 2001.

II B.Sc (PH)	APPLIED ELECTRONICS	19PH408
SEMESTER – IV		HRS/WK - 4
CORE -VIII		CREDIT - 3

OBJECTIVE:

To understand the FET character, various linear operational amplifier, 555 timer and D/A and A/D converter.

COURSE OUTCOMES:

At the end of the Course the students should be able to exhibit

CO1: Obtained knowledge of special devices and applications

CO2: Study of various linear operational amplifier circuits

CO3: Study of various applications of operational amplifier

CO4: Basis introduction of 555 timer and locked loop

CO5: Acquire basis ideas of D/A and A/D converter

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER - IV	COURSE CODE: 19PH408					COURSE TITLE: APPLIED ELECTRONICS						Hours : 4	Credit: 3
Course Outcomes COs	Programme Outcomes POs					Programme Specific Outcomes PSOs						Mean Score of CO's	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6		
CO1	3.5	4	3.5	3	3	3	3	2.5	3.5	3	3.5	3.23	
CO2	3.5	4	4	4	4	2.5	2.5	4	4	4	4	3.68	
CO3	3	3.5	3	2.5	4	4	4	3.5	3.5	4	4	3.55	
CO4	3	3.5	2.5	3.5	4	3.5	4	3.5	4	3.5	3.5	3.50	
CO5	4	3.5	4	3.5	3.5	4	3.5	3.5	3.5	3.5	3.5	3.64	
Mean Overall Score												3.52	

Result: The Score for this course is 3.52 (High)

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High
Value Scaling					
Mean Score of COs= $\frac{Total\ Values}{Total\ No.of\ POs\ \&\ PSOs}$			Mean Overall Score of COs= $\frac{Total\ Mean\ Scores}{Total\ No.of\ COs}$		

This course is having **High** association with Programme Outcome and Programme Specific Outcome

UNIT - I **(12 Hours)**

Special Devices and Applications: FET - Characteristics – parameter FET as amplifier – FET as VVR – MOSFET – Depletion and enhancement – UJT characteristics – UJT as relaxation oscillator – SCR characteristics.

UNIT – II **(12 Hours)**

Linear Operational Amplifier Circuits: OPAMP – Parameters – inverting and Non-inverting amplifier – gain – Miller effect – Virtual ground – offset voltage – offset current – PSRR - CMRR. OPAMP – Sign and scale changer – adder, subtractor and averager – integrator and differentiator – voltage follower – solving simultaneous linear equation

UNIT – III **(12 Hours)**

Applications of Operational Amplifier: OP AMP logarithmic amplifer – antilogarthmic amplifer – Logarithmic multiplier – Logarithmic divider. Comparator – Schmitt trigger – Astablemultivibrator – Monostablemultivibrator – Bistablemultivibrator – Wein Bridge oscillator – phase shift oscillator.

UNIT – IV **(12 Hours)**

555 Timer And PLL: 555 Timer block diagram - Monostable operation – Astable operation – Schmitt trigger. Phase – Locked Loops (PLL): Basic principles – phase Detector- Analog phase detector – Digital phase detector – voltage controlled oscillator (VCO).

UNIT – V **(12 Hours)**

D / A and A / D Converter: Weighted resistor D/A converter – 4bit R-2R ladder DAC – Analog to Digital converter – Stair case ADC– Successive approximation ADC

TEXT BOOKS:

1. Vijayendran, Integrated Physics, S.Viswanathan Pvt. Ltd., 2009.
2. R.S. Sedha, Applied Electronics,S. Chand & Company Ltd., 2nd New Edition, 2000.
3. M. Arul Thalapathi, Basic and Applied Electronics,Cometak Publisher Chennai, 2005.

REFERENCE BOOKS:

1. I.J. Jagrath, Electronics – Analog and Digital, Prentice – Hall of India, New Delhi, 1999.
2. Jacob Millman and Christos C. Halkias, Integrated Electronics, McGraw Hill International, 1971.
3. D. Roy Choudhury and Shall Jain, Linear Integrated Circuits, New age International (p) Ltd., 2010.

II B.Sc (PH)	PRACTICAL – IV	PHP404
SEMESTER – IV		HRS/WK - 3
CORE – PRACTICAL – IV		CREDIT - 2

(Any nine out of the given 12 experiments**)**

1. Potentiometer –comparison of EMF
2. Potentiometer- high range voltmeter
3. Spectrometer-dispersive power of a grating
4. Spectrometer-dispersive power of a prism
5. P.O. Box –resistance-temperature coefficient
6. Field along the axis of a circular coil deflection magnetometer – M – Null deflection method.
7. Carry Fosters bridge- temperature Co-efficient of Resistance
8. Field along the axis of a circular coil vibrational magnetometer
9. Variation of resistance with temperature (thermistor)
10. LCR Studies- Two Resistors- Two Capacitors – Two Inductors
11. EMF of a thermocouple – mirror galvanometer (or) table galvanometer
12. Potentiometer – emf of a thermocouple

III B.Sc (PH)	OPTICS & SPECTROSCOPY	19PH509
SEMESTER – V		HRS/WK - 5
CORE - IX		CREDIT - 5

OBJECTIVE:

Learn the basics of geometrical optics, Interference, Diffraction, Polarization and various types of spectroscopy.

COURSE OUTCOMES:

At the end of the Course the students should be able to exhibit

CO1: Learn the basics of Geometrical Optics and Lenses

CO2: Study the concepts Interference and its applications

CO3: Acquire Knowledge about Diffraction and its applications

CO4: To Understand the concept of Polarization and its application in analyzing the optical activities

CO5: To Procure the Fundamental knowledge of Spectroscopy

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER - V	COURSE CODE: 19PH509					COURSE TITLE: OPTICS & SPECTROSCOPY						Hours :5	Credits : 5
Course Outcomes COs	Programme Outcomes POs					Programme Specific Outcomes PSOs						Mean Score of CO's	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6		
CO1	1.4	3.3	1.1	3.1	2.3	4.2	4.2	4.1	3.8	4.7	2.3	3.13	
CO2	1.2	3.5	1.3	3.2	2.6	4.4	4.3	4.1	3.9	4.2	2.1	3.16	
CO3	1.6	3.8	1.4	3.2	2.6	4.8	4.6	3.9	3.8	4.0	2.4	3.28	
CO4	1.8	3.8	1.4	3.2	2.4	4.5	4.1	3.9	4.2	3.5	2.1	3.17	
CO5	1.2	3.6	1.1	3.3	2.9	4.1	4.4	4.0	4.1	4.3	2.1	3.19	
Mean Overall Score												3.186	

Result: The Score for this course is 3.186 (High)

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High
Value Scaling					
Mean Score of COs= $\frac{Total\ Values}{Total\ No.of\ POs\ \&\ PSOs}$			Mean Overall Score of COs= $\frac{Total\ Mean Scores}{Total\ No.of\ COs}$		

This course is having **High** association with Programme Outcome and Programme Specific Outcome

UNIT - I **(15 Hours)**

Geometrical Optics: 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 - Ramsden and Huygens's eyepieces– Angular dispersion – Dispersive power – combination of prisms to produce dispersion without deviation – Deviation without dispersion – Achromatic prisms Direct vision spectroscope.

UNIT - II **(15 Hours)**

Interference: Colours of thin films – Air wedge – Determination of diameter of a thin wire by air wedge – Test for optical flatness – 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.

UNIT - III **(15 hours)**

Diffraction: Fresnel diffraction – Diffraction at circular aperture, opaque circular disc, straight edge and narrow wire- Fraunhofer diffraction – single slit – double slit –Rayleigh's criteria – Resolving power of telescope, prism, microscope and grating.

UNIT - IV **(15 hours)**

Polarization: Double refraction – Nicol prism – polarizer and analyzer – Huygens's explanation of double refraction in uniaxial crystals – Dichroism – polaroids and their uses – plane, circularly and elliptically polarized light – production and detection – Optical Activity – Fresnel's explanation of optical activity – Specific rotatory power – Determination using Laurent's half shade polarimeter – Kerr effect and Faraday effect.

UNIT - V **(15 hours)**

Spectroscopy: Infrared spectroscopy, RAMAN, NMR, ESR - Principle –Instrumentation – applications-LASER, Principles of LASER, Semiconductor LASER, Nd-Yag LASER-Applications

TEXT BOOKS:

1. Subramaniam N & Brijlal, Optics, S. Chand & Co. Pvt. Ltd., New Delhi, 1990.
2. R. Murugesan, Optics and Spectroscopy S. Chand & Co. Pvt. Ltd., New Delhi, 2009.

REFERENCE BOOKS:

1. Lipson S G, Lipson H and Tannhauser D S, Optical Physics, Cambridge University Press, 1995.
2. D. Halliday, R. Resnick and J. Waler, Fundamentals of Physics, Wiley NY 6th Edition, 2001.
3. R. P. Feynman, R. B. Leighton and M. Sands, The Feynman Lectures on Physics, Vols.I, II and III Narosa, New Delhi, 1998.
4. G.Aruldhas, Spectroscopy, Vendeur Book Vistas (New Delhi, India), 2009.

III B.Sc (PH)	SOLID STATE PHYSICS	19PH510
SEMESTER – V		HRS/WK - 5
CORE - X		CREDIT - 5

OBJECTIVE:

Understand the various types of bonds in solids, X-ray diffraction techniques, Types of magnetic material, superconductors.

COURSE OUTCOMES:

At the end of the Course the students should be able to exhibit

CO1: To Learn the Fundamental of Bonds in Solids

CO2: To Study the concepts of X-ray diffraction its applications in solids

CO3: Understanding the properties of Magnetism and its applications in quantum physics

CO4: Acquiring the knowledge of Dielectrics and its properties in various materials

CO5: To Procure the knowledge of Superconductivity and its applications

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER - V	COURSE CODE: 19PH510					COURSE TITLE: SOLID STATE PHYSICS						Hours :5	Credits : 5
Course Outcomes COs	Programme Outcomes POs					Programme Specific Outcomes PSOs						Mean Score of CO's	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6		
CO1	1.1	3.5	1.2	3.3	2.2	4.4	4.3	4.1	4.5	3.6	2.4	3.14	
CO2	1.2	3.8	1.3	3.3	2.1	3.9	3.7	3.7	3.9	3.7	2.2	2.98	
CO3	1.6	3.8	1.2	3.1	2.3	4.8	4.1	3.8	3.8	3.9	2.5	3.17	
CO4	1.2	3.4	1.6	3.6	2.5	3.9	4.2	4.6	4.3	4.6	2.2	2.95	
CO5	1.4	4.0	1.1	3.7	2.2	4.0	3.9	4.2	4.5	4.3	2.1	3.21	
Mean Overall Score												3.09	

Result: The Score for this course is 3.09 (High)

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High
Value Scaling					
Mean Score of COs= $\frac{Total\ Values}{Total\ No.of\ POs\ \&\ PSOs}$			Mean Overall Score of COs= $\frac{Total\ Mean\ Scores}{Total\ No.of\ COs}$		

This course is having **High** association with Programme Outcome and Programme Specific Outcome

UNIT - I **(15 hours)**

Bonds In Solids: Crystal lattice- primitive and unit cell- seven classes of crystals – Bravais lattice- Miller indices- structure of crystals- simple cubic, Hexagonal close packed structure-Face centered cubic structure, Body centered cubic structure, Simple cubic structure-Sodium chloride structure, Zinc Blende structure, Diamond structure

UNIT - II **(15 hours)**

X-Ray Diffraction: Diffraction of x-rays by crystals-Bragg's law in one dimension-Experimental method in x-ray diffraction-Laue method, Rotating crystal method-Powder photograph method-von Laue's equations-Point defects- Line defects- Surface defects-Volume defects-Effects of crystal imperfections

UNIT - III **(15 hours)**

Magnetism: Different type of magnetic materials- Classical theory of Diamagnetism(Langevin theory)-Langevin theory of Paramagnetism – Weiss theory of Paramagnetism- Qualitative explanation of Heisenberg's Internal Field and Quantum Theory of Ferromagnetism.

UNIT - IV **(15 hours)**

Dielectrics: Fundamentals definitions in dielectrics – different types of electric polarization-Frequency and Temperature Effects on Polarization – Dielectric loss – Local Field on internal field Clausius-Mosotti Relation- Determination of Dielectric Constant – Dielectric Breakdown – Properties of Different types of insulating materials

UNIT - V **(15 hours)**

Superconductivity: Introduction-Meissner effect-Limitation- Type I& II Superconductivity-Vortex states- BCS Theory (Qualitative treatment only)-Josephson's effect-Copper pair tunneling

TEXT BOOKS:

1. S.O. Pillai, Solid State Physics,New Age Science Publication, 2009.
2. Arumugam, Materials Science, Anuradha Publications, 2015.
3. Puri & Babber, Solid State Physics,S. Chand Limited, 2008.

REFERENCE BOOKS:

1. C. Kittel, An introduction to Solid State Physics, 5th Edition, Published by John Wiley & Sons Inc, 1976.
2. Gupta and Kumar, Solid State Physics, KNath & Co., 2013.

III B.Sc (PH)	DIGITAL ELECTRONICS	19PH511
SEMESTER – V		HRS/WK - 5
CORE - XI		CREDIT - 4

OBJECTIVE:

Learn the fundamentals of digital electronics, microprocessor, solving Boolean algebra, various types of converters in electrical circuit and working of 8085 microrprocessor.

COURSE OUTCOMES:

At the end of the Course the students should be able to exhibit

CO1: To Learn the Fundamental of Digital electronics & Microprocessor

CO2: To Study the functions of Boolean Algebra

CO3: Obtaining the knowledge about Arithmetic circuits & Sequential Logic circuits

CO4: To Learn about the working of D/A & A/D Converters

CO5: To Introduce the concepts and working of microprocessor 8085

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER - V	COURSE CODE: 19PH511					COURSE TITLE: DIGITAL ELECTRONICS					Hours: 5	Credit: 4
Course Outcomes COs	Programme Outcomes POs					Programme Specific Outcomes PSOs						Mean Score of CO's
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1	2.1	3.5	2.2	3.3	3.5	3.6	4.3	3.6	4.2	4.3	1.1	3.24
CO2	3.2	3.8	2.3	3.5	2.8	3.4	4.4	3.2	4.6	4.7	1.2	3.43
CO3	1.1	3.6	1.2	3.1	3.3	3.8	4.1	3.8	4.4	4.4	1.5	3.11
CO4	4.0	3.4	1.4	2.6	3.5	3.8	4.6	3.3	4.3	4.1	1.2	3.29
CO5	2.4	4.0	1.3	3.7	3.6	4.0	4.4	4.3	4.3	4.0	1.1	3.37
Mean Overall Score												3.304

Result: The Score for this course is 3.304 (High)

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High
Value Scaling					
Mean Score of COs= $\frac{Total\ Values}{Total\ No.of\ POs\ \&\ PSOs}$			Mean Overall Score of COs= $\frac{Total\ Mean\ Scores}{Total\ No.of\ COs}$		

This course is having **High** association with Programme Outcome and Programme Specific Outcome

UNIT - I **(15 hours)**

Digital Fundamentals: Number systems – decimal, binary, octal and hexadecimal systems – conversion from one number system to another Codes – BCD code – excess 3 code, Gray code – ASCII code – Binary arithmetic – Binary addition – subtraction – unsigned binary numbers – sign magnitude numbers – I's and 2's complement – Binary multiplication and division.

Logic Gates and Logic Families

AND, OR circuits using diodes and transistors – NOT using transistors – NAND, NOR and EXOR – functions and truth tables. NAND & NOR as universal gates.

UNIT - II **(15 hours)**

Boolean Algebra And Simplification Of Logic Circuits: Laws and theorems of Boolean algebra – De Morgan's theorems and their circuit implications – Duality theorem, simplification of Boolean equations – Karnaugh map – pairs, quads, octets – 2,3 and 4 variables –SOP method – NAND – NAND circuits – POS method – NOR – NOR circuits.

UNIT - III **(15 hours)**

Arithmetic Circuits and Sequential Logic Circuits: Arithmetic building blocks – Half adder – Full adder – parallel binary adder – Half subtractor – Full subtractor – The adder-subtractor – digital comparator – parity checker/generator.Flip-flops –JK flip – flop – JK master slave flip-flop –Flip flop applications. Shift register functions- Shift right-shift left-Shift register applications.

UNIT - IV **(15 hours)**

D/A and A/D Converter: Introduction – variable resistor network – binary ladder – D/A converter – D/A accuracy and resolution – A/D converter – simultaneous conversion – A/D accuracy and resolution.

UNIT - V **(15 hours)**

Introduction to Microprocessor 8085: Basics of semiconductor memory- RAM, ROM, PROM and EPROM. Microcomputer organization-8085 Microprocessor-pin functions-architecture-machine and assembly language-programmer's model of 8085-8085 addressing modes. Classification of instruction and format – 8-bit data transfer and arithmetic instructions

TEXT BOOKS:

1. Vijayendran, Fundamentals of Microprocessor 8085, S. ViswanathanPrinters & Publishers Pvt.Ltd, 2006.
2. Vijayendran, Integrated Electronics, Viswanathan, S., Printers & Publishers Pvt. Ltd., 2009.
3. B. Ram, Introduction to Microprocessor and Microcontroller,DhanpatRai Publications, 2012.

REFERENCE BOOKS:

1. J.P. Agarwal and Anit Agarwal, Solid State Electronics, PragatiPrakashan, 2nd Edition, 2014.
2. Herbert Taub and Donald Schilling, Digital Integrated Electronics, McGraw Hill, 1st Edition, 2008.
3. Anokh Singh and A. K. Chhabra, Fundamentals of Digital Electronics and Microprocessors, 2nd Revised and Enlarged Ed., 2. Chand & Co. Ltd., New Delhi, 2005.

III B.Sc (PH)	ELECTRICAL WIRING	19EPH51A
SEMESTER – V		HRS/WK - 4
ELECTIVE – I Option(I)		CREDIT - 3

OBJECTIVE:

Understand the fundamentals of electricity, electrical parameters, various electrical symbols, electrical connections in house and their troubleshooting.

COURSE OUTCOMES:

At the end of the Course the students should be able to exhibit

CO1: To learn the fundamentals of electricity, electrical parameters and testing tool.

CO2: Understand different methods of electricity generation and types of motors.

CO3: Study the electrical components, symbols, types of circuits and tools

CO4: To Study the various methods of joining conductors and electrical accessories

CO5: Learn the methods of wiring a house and industry and Hands on training on house wiring and troubleshooting the electrical circuits and appliances

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER - V	COURSE CODE: 19EPH51A					COURSE TITLE: ELECTRICAL WIRING						Hours: 4	Credits: 3
Course Outcomes COs	Programme Outcomes POs					Programme Specific Outcomes PSOs						Mean Score of CO's	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6		
CO1	3.3	4.6	3.1	4.6	3.2	4.6	4.7	4.4	4.7	4.5	3.4	4.10	
CO2	3.0	4.7	3.5	4.6	3.1	4.1	4.8	4.8	4.6	4.3	3.1	4.03	
CO3	3.1	4.6	3.6	4.7	3.2	4.2	4.6	4.7	4.8	4.8	3.1	4.12	
CO4	3.0	3.8	3.4	4.6	3.1	4.3	4.7	4.6	4.5	4.5	3.3	3.98	
CO5	3.0	4.1	3.6	4.8	3.0	4.7	4.4	4.9	4.1	4.7	3.5	4.07	
Mean Overall Score												4.06	

Result: The Score for this course is 4.06 (High)

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High
Value Scaling					
Mean Score of COs= $\frac{Total\ Values}{Total\ No.of\ POs\ \&\ PSOs}$			Mean Overall Score of COs= $\frac{Total\ Mean\ Scores}{Total\ No.of\ COs}$		

This course is having **High** association with Programme Outcome and Programme Specific Outcome

UNIT - I **(12 hours)**

Electricity Generation: Fundamentals of electricity - Current, Voltage, resistance - Ohm's law - Power -Kilowatt hour - Watt meter - Electrical measurements - Electric powergeneration by Thermal, hydro, atomic and nuclear methods - Batteries -Generators - Study of Generator.

UNIT - II **(12 Hours)**

Electric Circuits and Distribution: Symbols of electrical parameters - Importance Series, Parallel connections -Ac and DC - Conductors - Inductor, Conductors -Inductor, Capacitor and transformer - Distribution methods - single phase and three phase - Star and delta connections - Rules of electric connections - SWG -Motors - Study of motor, series and parallel circuits.

UNIT - III **(12 Hours)**

Electrical Wiring - I: Tools - Methods of Joining conductors - House wiring methods - Gilt, wood casing, Tough - Rubber sheathed, conduit or PVC pipe and concealed –Switches - ceiling roze - lamp holders, sockets - Fuse base - Distribution box–Trip switches - Earth connection -Experimental study of house wiring.

UNIT - IV **(12 Hours)**

Electrical Wiring – II: Main board preparation - Distribution - Cut - out preparation - Switch board preparation - Power factor -IEE regulations - Safety precautions –Testing the insulation -Experimental study of main, distribution and switchboards.

UNIT - V **(12 Hours)**

Electrical Appliances & Safety Precautions: Tungsten - filament bulb - tube light -mercury and sodium vapour lamp -LED lamp - heater - iron box - table fan - ceiling fan - battery eliminator -electrical requirement to washing machine and refrigerator - procedure to rectify the electrical faults in electrical appliances.

Safety Precautions: Precautions in handling tools Electric shock-First aid on electric shock Precautions to be observed while installing different electric appliances in houses.

TEXT BOOKS:

Course material prepared by the Department

REFERENCE BOOKS:

1. Earl Gates, Introduction to Basic Electricity and Electronics Technology, Delmar, Cengage Learning, 2014

2. Stan Gibilisco, Dr. Simon Monk, Teach yourself Electricity and electronics, McGraw-Hill Education, 2016.

III B.Sc (PH)	NUMERICAL METHODS & BASIC COMPUTER PROGRAMMING	19EPH51B
SEMESTER – V		HRS/WK - 4
ELECTIVE – I Option(II)		CREDIT - 3

OBJECTIVE:

Understand the solve various fundamental mathematical equations, occurs knowledge of C language.

COURSE OUTCOMES:

At the end of the Course the students should be able to exhibit

CO1: To Learn the Solve various Fundamental mathematical equations

CO2: To Study the functions of Interpolation methods

CO3: Acquiring the knowledge about Numerical integration & Differentiation

CO4: To Learn the Basic of C Language

CO5: To Procure the concepts of Control Statements in C Language

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER - V	COURSE CODE: 19EPH51B					COURSE TITLE: NUMERICAL METHODS & BASIC COMPUTER PROGRAMMING					Hours: 4	Credits: 3
Course Outcomes COs	Programme Outcomes POs					Programme Specific Outcomes PSOs						Mean Score of CO's
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1	1.1	3.8	1.1	3.4	3.5	3.4	4.3	4.6	3.2	3.3	2.1	3.07
CO2	2.2	3.6	1.1	3.5	2.8	3.6	4.4	4.2	3.5	3.5	1.1	3.04
CO3	2.1	3.7	1.1	3.1	3.3	3.3	4.1	4.8	3.3	3.6	1.1	3.04
CO4	3.4	4.4	1.0	4.6	3.5	4.2	4.1	3.3	2.1	3.8	2.2	3.32
CO5	3.6	4.0	1.0	4.7	3.6	4.0	4.3	4.5	2.0	4.4	2.1	3.47
Mean Overall Score												2.926

Result: The Score for this course is 2.926 (Moderate)

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High
Value Scaling					
Mean Score of COs= $\frac{Total\ Values}{Total\ No.of\ POs\ \&\ PSOs}$			Mean Overall Score of COs= $\frac{Total\ Mean Scores}{Total\ No.of\ COs}$		

This course is having **Moderate** association with Programme Outcome and Programme Specific Outcome

UNIT - I **(12 Hours)**

Solution Of Equation: Eigen values, Eigen vectors, Cayley Hamilton; characteristic equation of a matrix –Solution of simultaneous equations – Gauss elimination method – Gauss-Jordan method

UNIT - II **(12 Hours)**

Interpolation: Linear and Lagrange interpolation – Newton's forward & backward interpolation polynomial equation & determination of roots – Newton-Raphson method

UNIT - III **(12 Hours)**

Numerical Integration and Differentiation: Trapezoidal rule – Simpson rule 1/3 & 3/8 – Solution of first & second order differential equation: Taylor series – Euler's method (Improved & Modified) – Solutions of forth order Runge-Kutta method.

UNIT - IV **(12 Hours)**

Data Type Operators: History & Features of C Language - Variable name – data type and sizes – declaration – arithmetic, relational and logical operators – precedence and order of evaluation

UNIT - V **(12 Hours)**

Control Statements & IPR: Unconditional control statements – GOTO and labels – Conditional control statements – simple IF, IF..ELSE, nested IF..ELSE, ELSE IF ladder – switch case – break – continue statement. Looping statement – while – do..while – for – nested for loop – (**Basic Programs - Qualitative studies only)** - Introduction and the need for intellectual property right (IPR) - Kinds of Intellectual Property Rights: Patent, Copyright, Trade Mark

TEXT BOOKS:

1. S.S. Sastry, Numerical Methods, Prentice Hall India Learning Private Limited; Fifth edition 2012.
2. Thilagavathi, Numerical Methods, Published by S. Chand & Company Ltd., 2013.

REFERENCE BOOKS:

1. Satya Prakash, Mathematical Physics, 4th Ed., Sultan Chand & Sons Publication, New Delhi, 2014.
2. A. Singaravelu, Numerical methods, 1st Ed., Meenakshi Publication, Tamil Nadu, 2008.

III B.Sc (PH)	GEOPHYSICS	19EPH52A
SEMESTER – V		HRS/WK - 5
ELECTIVE – II Option(I)		CREDIT - 3

OBJECTIVE:

Understand formation of earth and solar system, geographical fields, concepts of seismology and geodynamics.

COURSE OUTCOMES:

At the end of the Course the students should be able to exhibit

CO1: To know the information about the earth and solar system

CO2: To Learn the interpretation of Mathematical functions in geographical fields

CO3: Obtaining the knowledge about the Magnetic field on earth

CO4: To Learn the concepts of Sesimology

CO5: To Learn the basics of Geodynamics

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER - V	COURSE CODE: 19EPH52A					COURSE TITLE: GEOPHYSICS						Hours: 5	Credits: 3
Course Outcomes COs	Programme Outcomes POs					Programme Specific Outcomes PSOs						Mean Score of CO's	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6		
CO1	2.1	2.8	1.0	2.4	2.5	3.3	3.3	3.8	3.1	3.2	1.1	2.6	
CO2	2.2	2.4	1.1	2.5	2.1	3.5	3.4	3.2	3.6	3.2	1.2	2.58	
CO3	2.3	2.7	1.0	2.7	2.3	3.1	3.7	3.2	3.1	3.3	1.1	2.59	
CO4	3.3	3.4	1.0	2.6	2.2	3.7	3.2	3.6	3.5	3.1	1.2	2.8	
CO5	2.6	2.0	1.0	2.5	2.1	3.0	3.1	3.0	2.0	3.4	1.1	2.34	
Mean Overall Score												2.582	

Result: The Score for this course is 2.582 (Moderate)

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High
Value Scaling					
Mean Score of COs= $\frac{Total\ Values}{Total\ No.of\ POs\ \&\ PSOs}$			Mean Overall Score of COs= $\frac{Total\ Mean\ Scores}{Total\ No.of\ COs}$		

This course is having **Moderate** association with Programme Outcome and Programme Specific Outcome

UNIT - I **(15 Hours)**

The Earth In The Solar System: Solar System Formation, Accretion, and the Early Thermal State of the Earth-Rotation and Angular Momentum- The Sun-Planetary Formation-Early Thermal State of the Earth- Radioactive Decay-Radiometric Dating- Radioactivity as a Heat Source-Meteorites and the Bulk Composition of the Earth-Chondrites-Secondary Processing-Achondrites-Irons and Stony-Irons-The Terrestrial Planets-One-dimensional Earth's Structure-Lateral Heterogeneity in the Mantle

UNIT - II **(15 Hours)**

The Earth's Gravitational Field: Global Gravity, Potentials, Figure of the Earth, Geoid-Gravitational Potential due to Nearly Spherical Body-The Poisson and Laplace Equations-Cartesian and Spherical Coordinate Systems-Spherical Harmonics-Global Gravity Anomalies- Gravity Anomalies and the Reduction of Gravity Data- Correlation between Gravity Anomalies and Topography-Flexure and Gravity.

UNIT - III **(15 Hours)**

The Magnetic Field Of The Earth: The Main Field-The Internal Field- The External Field-The Magnetic Induction due to a Magnetic Dipole-Magnetic Potential due to More Complex Configurations-Power Spectrum of the Magnetic Field-Downward Continuation-Secular Variation.

UNIT - IV **(15 Hours)**

Seismology: Introduction- Strain-Stress-Equations of Motion, Wave Equation, P and S-waves-From Vector to Scalar Potentials – Polarization-Solution by Separation of Variables- Plane Waves-Snell's Law-Fermat's Principle and Snell's Law- Ray Geometries of the Wave Field-Travel Time Curves and Radial Earth Structure-Surface Waves- Sensitivity Kernels-Excitation of Surface Waves-Dispersion: Phase and Group Velocity-Dispersion Curves- Seismology: Free Oscillation

UNIT - V **(15 Hours)**

Geodynamics: Heat Flow- Heat Flow, Geothermal Gradient, Diffusion-Thermal Structure of the Oceanic Lithosphere-Thermal Structure of the Oceanic Lithosphere (cont.)-Bending, or Flexure, of Thin Elastic Plate-The Upper Mantle Transition Zone.

TEXT BOOKS:

1. Lowrie, William. Fundamentals of Geophysics. Cambridge, UK: Cambridge University Press, September 1997.
2. Fowler, C. M. R. The Solid Earth: An Introduction to Global Geophysics. Second Edition. Cambridge, UK: Cambridge University Press, 2004.

REFERENCE BOOKS:

1. Turcotte, Donald L., and Gerald Schubert. Geodynamics. 2nd ed. Cambridge, UK: Cambridge University Press, 2001.
2. Stein, Seth, and Michael Wysession. An Introduction to Seismology, Earthquakes and Earth Structure. Malden, MA: Blackwell Science, 2002.

III B.Sc (PH)	FIBER OPTIC COMMUNICATION	19EPH52B
SEMESTER – V		HRS/WK - 5
ELECTIVE – II Option(II)		CREDIT - 3

OBJECTIVE:

Understand the basics of optical fibers, character, communication process and various types of connectors and couplers.

COURSE OUTCOMES:

At the end of the Course the students should be able to exhibit

CO1: To understand the basics of optic fibers

CO2: To study the information about the characteristics of fiber optics

CO3: To Obtain the knowledge about the Communication processes

CO4: To study the functions of couplers and connectors

CO5: Procuring the functions of Analog and Digital Links

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER - V	COURSE CODE: 19EPH52B					COURSE TITLE: FIBER OPTIC COMMUNICATION						Hours: 5	Credits: 3
Course Outcomes COs	Programme Outcomes POs					Programme Specific Outcomes PSOs						Mean Score of CO's	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6		
CO1	2.1	3.8	2.0	3.5	2.2	4.6	3.2	3.4	4.3	3.4	2.1	3.14	
CO2	2.2	3.6	2.2	3.4	2.1	4.1	3.4	3.8	4.4	3.2	2.1	3.13	
CO3	2.3	2.2	2.4	3.3	2.2	4.4	3.4	3.7	4.6	3.3	2.1	3.08	
CO4	2.4	2.4	2.0	3.1	2.1	4.3	3.2	3.6	4.4	3.5	2.3	3.02	
CO5	2.6	2.4	2.4	2.8	2.4	4.7	3.3	3.8	3.1	3.8	2.1	3.18	
Mean Overall Score												3.11	

Result: The Score for this course is 3.11 (High)

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High
Value Scaling					
Mean Score of COs= $\frac{Total\ Values}{Total\ No.of\ POs\ \&\ PSOs}$			Mean Overall Score of COs= $\frac{Total\ Mean Scores}{Total\ No.of\ COs}$		

This course is having **High** association with Programme Outcome and Programme Specific Outcome

UNIT – I **(15 Hours)**

Optic Fibers: Fiber optic revolution – basic characteristics of optical fiber – acceptance angle – numerical aperture – propagation of light through optical fiber – theory of mode formation – classification of fibers – step index and graded index fibers – single mode and multi mode fibers

UNIT – II **(15 Hours)**

Transmission Characteristics Of Optical Fibers: Introduction, Attenuation, absorption, scattering losses, bending loss, dispersion, Intra model dispersion, Inter model dispersion

UNIT – III **(15 Hours)**

Fiber Optic Communication: Source and detectors for fiber optic communication – Laser and LED – Analog and digital modulation methods – principle of optical detection – pin and APD photo detectors – Noise – Design consideration of a fiber optic communication system.

UNIT – IV **(15 Hours)**

Fiber Couplers and Connectors: Introduction, fiber alignment and joint loss, single mode fiber joints, fiber splices, fiber connectors and fiber couplers.

UNIT - V

Analog And Digital Links : Analog links – Introduction, overview of analog links, CNR, multichannel transmission techniques, RF over fiber, key link parameters, Radio over fiber links, microwave photonics. Digital links – Introduction, point–to–point links, System considerations, link power budget, resistive budget, short wave length bandand transmission distance for single mode fibers, Power penalties, nodal noise and chirping.

TEXT BOOKS:

1. R. Murugeshan, Modern Physics, S. Chand & Co., 2009.
2. Senthil Kumar, Engineering Physics, VRB Publishers Pvt. Ltd., 2013.

REFERENCE BOOKS:

1. John M. Senior, Optical Fiber Communications, Cambridge University Press, 1996.
2. Govind P. Agrawal, Fiber – Optic Communication Systems, John- Willey & Sons, 2007.
3. P. K. Palanisamy, Physics for Engineering, Scitech publishing Pvt. Ltd., Chennai, 2009.

III B.Sc (PH)	PHYSICS IN EVERYDAY LIFE	19SSPH52
SEMESTER - V		HRS/WK-0
SSC		CREDIT-2

OBJECTIVES:

- To acquire the knowledge about the fundamental parameters in physics and to understand their applications in daily life.
- To understand the flow of heat and its transmission in different forms and to develops a scientific quest among students.
- Transmission of sound waves, characteristics and their applications in human system.
- To discern the basic application of geographical physics, and their utilization in the field of Medication.
- To comprehend the basic ideas of physics in space science and communication networking.

UNIT –I

Mechanics: Weight – Mass - Force – Laws of Motion-– Work - Energy – Power- Friction – Centre of Gravity – Torque – Momentum – Angular Momentum.

UNIT – II

Heat: Flow of Heat & Thermal Equilibrium (Applications – Riveting- bimetallic strip – Units of Heat energy – Transmission of heat – Conduction –Convection – Radiation –(Applications – Ocean Currents –Car Radiators – Ventilation – Wind system in atmosphere – Thermos flask).

UNIT –III

Sound & Optics: Sound waves – Doppler Effect –Power of Lens - Physics in the human body: The eyes as an optical instrument; vision defects; Rayleigh criterion and resolving power; sound waves and hearing; sound intensity; the decibel scale.

UNIT – IV

Geo & Medical Physics: Earthquake Richter scale - thunder and lightning - Lightning arrestors Cosmic showers - X-rays Ultrasound scan CT scan – MRI scan.

UNIT – V

Space Science & Communication: Newton's law of gravitation - Weather forecasting and communication satellites – Indian Satellites- Electromagnetic spectrum- Radio Waves AM & FM transmission and reception.

TEXT BOOKS:

1. University Physics by F. W. Sears, M. Zemansky, R. A. Freedman, and H. D. Young, PearsonEducation
2. Fundamentals of Physics by D. Halliday, R. Resnick, J. Walker, John Wiley & Sons

III B.Sc (PH)	PRACTICAL -V	PHP505
SEMESTER- V		HRS/WK-6
CORE PRACTICAL - V		CREDIT-4

(Any Twelve out of fourteen of the Following)

1. Young's modulus – Koenig's method – non uniform bending
2. Newton's rings – R1, R2 and μ of a convex lens
3. Spectrometer i – i' curve
4. Spectrometer – narrow angled prism – μ of the prism.
5. Spectrometer – Cauchy's constant
6. Construction of voltage regulator (2 Diodes)-Zener Diode
7. RC coupled single stage amplifier
8. Construction of a low range power pack- Two diodes
9. BG comparison of EMFs
10. Potentiometer - Conversion of galvanometer into voltmeter
11. BG – Absolute Capacitance
12. BG – comparison of capacitances BG – absolute capacitance of a capacitor
13. BG – comparison of Mutual Inductance.
14. Transistor characteristics – CE mode.

III B.Sc (PH)	RELATIVITY & QUANTUM MECHANICS	21PH612
SEMESTER - VI		HRS/WK-5
CORE - XII		CREDIT- 5

OBJECTIVE:

Understand the basics of relativity, waves and matters, solving Schrödinger equation and its applications.

COURSE OUTCOMES:

At the end of the Course the students should be able to exhibit

CO1: To understand the concept of Relativity

CO2: To Learn the principles & properties of waves and matter

CO3: To know about the Schrodinger equations and its applications

CO4: To study the mathematical functions in physics

CO5: To Gain the knowledge about the special functions

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER - VI	COURSE CODE: 21PH612					COURSE TITLE: RELATIVITY & QUANTUM MECHANICS					Hours: 5	Credits: 5
Course Outcomes COs	Programme Outcomes POs					Programme Specific Outcomes PSOs						Mean Score of CO's
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1	3.3	4.6	3.1	4.6	3.2	4.6	4.7	4.4	4.7	4.5	3.4	4.10
CO2	3.0	4.7	3.5	4.6	3.1	4.1	4.8	4.8	4.6	4.3	3.1	4.03
CO3	3.1	4.6	3.6	4.7	3.2	4.2	4.6	4.7	4.8	4.8	3.1	4.12
CO4	3.0	3.8	3.4	4.6	3.1	4.3	4.7	4.6	4.5	4.5	3.3	3.98
CO5	3.0	4.1	3.6	4.8	3.0	4.7	4.4	4.9	4.1	4.7	3.5	4.07
Mean Overall Score												4.06

Result: The Score for this course is 4.07 (High)

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High
Value Scaling					
Mean Score of COs= $\frac{Total\ Values}{Total\ No.of\ POs\ \&\ PSOs}$			Mean Overall Score of COs= $\frac{Total\ Mean Scores}{Total\ No.of\ COs}$		

This course is having **High** association with Programme Outcome and Programme Specific Outcome

UNIT - I **(15 hours)**

General Relativity: Frames of references - Newtonian relativity-Galilean invariance and conservation laws- postulates of general theory of relativity - propagation of light-Michelson-Morley experiment - significance of negative result - search for ether

UNIT - II **(15 hours)**

Special Relativity: Postulates of special theory of relativity - Lorentz transformation equations - Length contraction - Time dilation - Relativity of simultaneity - Law of addition of velocities - variation of mass with velocity - relativistic kinetic energy equations Minkowski's four dimensional spaces -time continuum.

UNIT - III **(15 hours)**

Wave Mechanics: Dual Nature of Matter-Matter waves - de Broglie wavelength De Broglie's Hypothesis of Matter Wave-Conservation of Energy-Expression for wave velocity and group velocity - Heisenberg's Uncertainty principle-Mathematical proof of uncertainty Experimental study of matter waves-proof of Uncertainty principle for one dimensional wave packet

UNIT - IV **(15 hours)**

Schrödinger Equations: Wave function-properties of wave functions- Postulates of wave mechanics -Probability Current density- Equality of Continuity theorem- Eigen functions - Eigen values - expectation values - Time dependent and time independent Schrödinger equation.

UNIT - V **(15 hours)**

Application Of Schrödinger Equations: Particle in a one dimensional box - barrier penetration and tunneling effect - linear harmonic oscillator - zero point energy - rigid rotator - hydrogen atom.

TEXTBOOKS:

1. Quantum Mechanics by V. Devanathan, Narosa, Chennai, 2005.
2. Modern physics by R Murugeshan, Kiruthiga, Sivaprasath S Chand & Co.(2007)
3. Quantum Mechanics by V K Thangappan, Wiley Eastern

REFERENCE BOOKS:

1. A Text Book of Quantum Mechanics by P M Mathews and Venkatesan,, McGraw Hill
2. Quantum mechanics by Ghatak and Loganathan, McMillan
3. Basic quantum mechanics by A Ghatak, McMillan India (2002)

III B.Sc (PH)	NUCLEAR & RADIATION PHYSICS	19PH613
SEMESTER - VI		HRS/WK-5
CORE - XIII		CREDIT- 5

OBJECTIVE:

To study the nuclear structure, radioactive decay, particle accelerators, and working of nuclear reactor.

COURSE OUTCOMES:

At the end of the Course the students should be able to exhibit

CO1: To understand the Basic concept Nuclear Structure

CO2: To Acquire knowledge about Radio Active Decay

CO3: Understanding the Construction & Working of various Particle Accelerators

CO4: To study the Working of Nuclear reactors & Radiation

CO5: To study the Basic Classification of Elementary Particles

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER - VI	COURSE CODE: 19PH613					COURSE TITLE: NUCLEAR & RADIATION PHYSICS					Hours: 5	Credits: 5
Course Outcomes COs	Programme Outcomes POs					Programme Specific Outcomes PSOs						Mean Score of CO's
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1	3.2	4.3	3.1	4.1	3.0	4.5	4.5	4.5	4.7	4.6	3.8	4.02
CO2	3.1	3.9	3.3	4.2	3.1	4.7	4.5	4.8	4.3	4.4	3.7	4.00
CO3	3.0	4.6	3.1	4.5	3.0	4.1	4.4	4.7	4.5	4.5	3.6	4.17
CO4	3.4	3.8	3.2	4.5	3.1	4.5	4.8	4.3	4.7	4.6	3.6	4.04
CO5	3.5	4.5	3.2	4.8	3.7	4.8	4.9	4.9	3.8	4.8	3.4	4.20
Mean Overall Score												4.086

Result: The Score for this course is 4.086 (High)

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High
Value Scaling					
Mean Score of COs= $\frac{Total\ Values}{Total\ No.of\ POs\ \&\ PSOs}$			Mean Overall Score of COs= $\frac{Total\ Mean\ Scores}{Total\ No.of\ COs}$		

This course is having **High** association with Programme Outcome and Programme Specific Outcome

UNIT – I **(15 hours)**

Nuclear Structure: Nuclear spin – determination of magnetic dipole moment, electric quadruple moment, parity of nuclei, isospin, theories of nuclear composition, proton and electron hypothesis, proton – neutron hypothesis, nuclear forces – meson theory of nuclear forces.

Liquid drop model – Bethe Weizacker's mass formula – application to alpha decay – Bohr – Wheeler theory – shell model – evidences – theory – energy level diagram – spin orbit interaction – magic numbers – nuclear stability.

UNIT – II **(15 hours)**

Radioactive Decay: Radioactive disintegration – law of successive disintegration – transport and secular equilibrium – radioactive series – Geiger – Nuttal law – Age of earth – alpha particle disintegration energy – alpha particle spectra – theory of alpha decay (Qualitative treatment).Beta ray spectra – origin – neutrino theory of beta decay – electron capture – gamma rays – determination of wavelength by Diamond – crystal spectrometer – nuclear isomerism.

UNIT – III **(15 hours)**

Particle Accelerators And Detectors: Cyclotron – synchrocyclotron – Betatron – electron synchrotron – proton synchrotron (Bevatron)-GM counter – ionization chamber – bubble chamber – scintillation counter – photographic emulsion techniques.

UNIT – IV **(15 hours)**

Reactors And Radiation Physics: Nuclear fission – Chain reaction – four-factor formula – reactor theory – critical size of a reactor – general aspect of reactor design – reactor shielding – reactor control – classification of reactors – pressurized heavy water reactor – fast breeder reactor-Introduction to recent rectors.

Radiation hazards – biological effects of radiation - radiation sickness – radiation units and operational limits radiation survey meters – pocket dosimeter –control of radiation hazards – radiation therapy – radioisotopes used for therapy – nuclear medicine – industrial applications – food preservatives.

UNIT – V **(15 hours)**

Elementary Particles: Classification – types of interaction – symmetry and conservation laws – hadrons – leptons – baryons – mesons – strangeness – hyperons – antiparticles – antimatter – basic ideas about quarks – types of quarks.

TEXT BOOKS:

1. Brijlal and N.Subramaniam-Modern Physics
2. D.C. Tayal, Nuclear Physics, Himalaya Publishing House, 2011.
3. R. Murugeshan & Kiruthiga, Sivaprasath, Modern Physics, S. Chand & Co., 2009

REFERENCE BOOKS:

1. S. N. Ghoshal, Nuclear Physics, S Chand & Co. Edition, 2003.
2. M. L. Pandya, R.P.S. Yadav, Elements of Nuclear Physics, KedarNath& Ram Nath Publishers, 2000.
3. Nuclear Physics – J B Rajam, S chand Publishing Co.

III B.Sc (PH)	ASTROPHYSICS	19PH614
SEMESTER - VI		HRS/WK-5
CORE - XIV		CREDIT- 4

OBJECTIVE:

To study the Astronomy, celestial mechanics, various astronomical instruments, stellar structure and stellar evolution.

COURSE OUTCOMES:

At the end of the Course the students should be able to exhibit

CO1: Study about the History of Astronomy and Celestial Mechanics

CO2: Learn the concepts of astronomical instrumentation

CO3: Acquire Knowledge of Stellar Magnitudes and Colors

CO4: Be familiar with the Stellar structure

CO5: Apply the knowledge of Stellar evolution

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER - VI	COURSE CODE: 19PH614					COURSE TITLE: ASTROPHYSICS						Hours: 5	Credits: 4
Course Outcomes COs	Programme Outcomes POs					Programme Specific Outcomes PSOs						Mean Score of CO's	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6		
CO1	3	3.8	4	3.5	3.5	2.8	3.5	3	4	3	3.5	3.41	
CO2	3.8	3.2	3	3	3.5	3.6	4	3.5	3	2.6	3.5	3.33	
CO3	3.5	4	3.2	2.5	3	3	3	3.5	3.5	3	3	3.2	
CO4	3	3.8	3	3.8	3	4	3	2.8	3.5	3	3.5	3.30	
CO5	4	2.5	3.5	3	3.5	2.5	3.5	3	3	3	2.5	3.09	
Mean Overall Score												3.27	

Result: The Score for this course is 3.27 (High)

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High
Value Scaling					
Mean Score of COs= $\frac{Total\ Values}{Total\ No.of\ POs\ \&\ PSOs}$			Mean Overall Score of COs= $\frac{Total\ Mean Scores}{Total\ No.of\ COs}$		

This course is having **High** association with Programme Outcome and Programme Specific Outcome

UNIT - I **(15 hours)**

Astronomy: History of Astronomy Celestial Mechanics; Distances in Astronomy; Magnitude Scale; Color-index Size and Time Scales

UNIT - II **(15 hours)**

Astronomical Instrumentation: Basic Optics; Optical Telescopes; Radio Telescopes; Infrared, Ultraviolet, X-ray, and Gamma-Ray Astronomy

UNIT - III **(15 hours)**

Stars: Stellar Magnitudes and Colors, Brightness and distance, Luminosity, temperature and spectral class, the motion of stars relative to the Sun, the masses of stars

UNIT - IV **(15 hours)**

Stellar Structure: Equations of Stellar Structure – Solutions to Equations of Stellar Structure, Toy Stellar Models: Homologous Stellar Models, the Radiative Stellar Envelope, and Fully Convective Stars with H~ Opacity, Observational Aspects of Stellar Atmospheres, Continuum Radiation, and Lines

UNIT - V **(15 hours)**

Stellar Evolution: Stellar Clusters Evolution of massive stars, Supernovae, Gamma-Ray bursts White Dwarfs, Chandrasekhar Limit, Neutron Stars, Pulsars GTR, Black holes.

TEXT BOOKS:

1. Bradley Carroll & Dale Ostlie, An Introduction to Modern Astrophysics , 2006.
2. T Padmanabhan, Theoretical Astrophysics: Vol. I-II-III, Cambridge University Press (2005).
3. Swapan K Saha, Diffraction-limited imaging with large and moderate telescopes, World Scientific,(2007).

REFERENCE BOOKS:

1. Chandrasekhar S, An Introduction to the Study of Stellar Structure, Dover Publications (1967).
2. Binney J, and Merrifield, Galactic Astronomy, Princeton University Press (1998).

III B.Sc (PH)	BASIC COMPUTATION FOR PHYSICS	19EPH63A
SEMESTER - VI		HRS/WK-4
ELECTIVE – III Option(I)		CREDIT- 3

OBJECTIVE:

To study appreciation programme for the common man, uses of computer for basis purpose, introduction to Origin software and Adobe photoshop.

COURSE OUTCOMES:

At the end of the Course the students should be able to exhibit

CO1: Impart basic level appreciation programme for the common man

CO2: Use the computer for basic purposes of preparing his personnel/business letters

CO3: Understand the usage of spread sheet

CO4: Be familiar with making small presentations

CO5: Apply the knowledge of Origin software & Adobe Photoshop

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER - VI	COURSE CODE: 19EPH63A					COURSE TITLE: BASIC COMPUTATION FOR PHYSICS					Hours: 4	Credits: 3
Course Outcomes COs	Programme Outcomes POs					Programme Specific Outcomes PSOs						Mean Score of CO's
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	
CO1	3.2	2.8	4.1	3.5	3	2.8	3.5	3.1	4	3.4	3.2	3.32
CO2	3.5	3.2	3	3	3.5	3.6	4	3.6	3	2.6	3.5	3.31
CO3	3.5	4.2	3.2	2.8	3	3.2	3	3.5	3.7	3.5	3.2	3.34
CO4	3.2	3.6	3	4	3	3.5	3.5	2.8	3.5	3.1	3.6	3.34
CO5	4.1	3.5	3.7	3.2	3.5	2.5	3.5	3	4.1	3.2	3.5	3.43
Mean Overall Score												3.34

Result: The Score for this course is 3.34 (High)

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High
Value Scaling					
Mean Score of COs= $\frac{Total\ Values}{Total\ No.of\ POs\ \&\ PSOs}$			Mean Overall Score of COs= $\frac{Total\ Mean Scores}{Total\ No.of\ COs}$		

This course is having **High** association with Programme Outcome and Programme Specific Outcome

UNIT - I **(12 Hours)**

Computer, Communications And Collaboration: Introduction - Components of Computer System -Concept of Hardware and Software -Application Software-Systems software-Concept of computing, data and information- Applications of IECT - e-governance - Connecting keyboard, mouse, monitor and printer to CPU - Checking power supply-Operating system -The User Interface -Task Bar-Icons-Menu-Running an Application. Introduction- Basics of E-mail- Using E-mails -Opening Email account-Mailbox: Inbox and Outbox -Creating and sending a new E-mail - Replying to an E-mail message -Forwarding an E-mail message -Sorting and Searching emails-document collaboration -Netiquettes

UNIT - II **(12 Hours)**

Understanding Word Processing: Introduction-Opening Word Processing Package -Menu Bar-Using The Help -Using The Icons Below Menu Bar-Opening and closing Documents -Opening Documents- Save and Save as -Page Setup -Print Preview -Printing of documents -Text Creation and manipulation -Document Creation -Editing Text - Text Selection -Cut, Copy and Paste -Spell check-Thesaurus -Formatting the Text- Font and Size selection -Alignment of Text - Paragraph Indenting -Bullets and Numbering -Changing case -Table Manipulation -Draw Table -Changing cell width and height -Alignment of Text in cell -Delete / Insertion of row and column -Border and shading

UNIT - III **(12 Hours)**

Using Spread Sheet: Introduction -Elements of Electronic Spread Sheet-Opening of Spread Sheet-Addressing of Cells-Printing of Spread Sheet-Saving Workbooks-Manipulation of Cells -Entering Text, Numbers and Dates -Creating Text, Number and Date Series- Editing Worksheet Data-Inserting and Deleting Rows, Column -Changing Cell Height and Width-Formulas and Function-Using Formulas-Function

UNIT - IV **(12 Hours)**

Making Small Presentations: Introduction - Using PowerPoint -Opening A PowerPoint Presentation- Saving A Presentation -Creation of Presentation-Creating a Presentation Using a Template-Creating a Blank Presentation-Entering and Editing Text-Inserting And Deleting Slides in a Presentation-Preparation of Slides-Inserting Word Table or An Excel Worksheet-Adding Clip Art Pictures-Inserting Other Objects-Resizing and Scaling an Object -Presentation of Slides-Viewing A Presentation-Choosing a Set Up for Presentation-Printing Slides And Handouts-Slide Show -Running a Slide Show-Transition and Slide Timings -Automating a Slide Show

UNIT - V **(12 Hours)**

Origin Software: Origin 8-Data analysis and Graphing workspace-Workbook-Worksheet& Worksheets column-Importing and Exporting data-Graphing: Customizing and Formatting the graph-Fitting analysis

TEXT BOOKS:

1. Lisa Ruffolo Dolores Wells, Computer Literacy BASICS ,Course Technology Inc, 2014.
2. Peter Weverka, Office 365 All-in-One,2019

REFERENCE BOOKS:

1. Fundamentals of Computers by ReemaThareja from Oxford University Press
2. Photoshop: Beginner's Guide for Photoshop - Digital Photography, Photo Editing, ColorGrading & Graphic...19 February 2016 by David Maxwell.

III B.Sc (PH)	ENERGY PHYSICS	19EPH63B
SEMESTER - VI		HRS/WK-4
ELECTIVE – III Option(II)		CREDIT- 3

OBJECTIVE:

To study various conventional and non conventional energy sources, know about the biomass energy, geothermal energy.

COURSE OUTCOMES:

At the end of the Course the students should be able to exhibit

CO1: Study about the Conventional Energy Sources

CO2: Learn about the Non-Conventional Energy Sources

CO3: Acquire Knowledge of Biomass energy

CO4: Be familiar with the geothermal energy

CO5: Apply the knowledge of Energy storage and impacts of Non-conventional energy

Relationship Matrix Course Outcomes, Programme Outcomes and Programme Specific Outcomes

SEMESTER - VI	COURSE CODE: 19EPH63B					COURSE TITLE: ENERGY PHYSICS						Hours: 4	Credits: 3
Course Outcomes COs	Programme Outcomes POs					Programme Specific Outcomes PSOs						Mean Score of CO's	
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6		
CO1	3.2	3.8	4.1	3.5	3	2.8	3.5	3.1	4	3	3.2	3.38	
CO2	3.5	3.2	3.2	3	3.5	3.6	4	3.6	3	2.6	3.8	3.36	
CO3	3.5	4.1	3.2	2.6	3	3.2	3	3.5	3.5	3.5	3	3.28	
CO4	3.2	3.8	3	4	3	4	3.5	2.8	3.5	3	3.6	3.4	
CO5	4	3.5	3.5	3.2	3.5	2.5	3.5	3	4	3	3.5	3.38	
Mean Overall Score												3.36	

Result: The Score for this course is 3.36 (High)

Mapping	1-20%	21-40%	41-60%	61-80%	81-100%
Scale	1	2	3	4	5
Relation	0.0-1.0	1.1-2.0	2.1-3.0	3.1-4.0	4.1-5.0
Quality	Very Poor	Poor	Moderate	High	Very High
Value Scaling					
Mean Score of COs= $\frac{Total\ Values}{Total\ No.of\ POs\ \&\ PSOs}$			Mean Overall Score of COs= $\frac{Total\ Mean Scores}{Total\ No.of\ COs}$		

This course is having **High** association with Programme Outcome and Programme Specific Outcome

UNIT – I **(12 hours)**

Conventional Energy Sources: World's reserve of commercial energy sources and their availability-various forms of energy- renewable and conventional energy systems-comparison and natural gas – availability –statistical details-applications- merits and demerits

UNIT- II **(12 hours)**

Non-Conventional Energy Sources: Renewable energy sources- solar energy- nature of solar radiation- components-solar heaters- crop dryers- space cooling-solar ponds-solar cookers-water desalination- photovoltaic generation basics- merits and demerits of solar energy

UNIT- III **(12 hours)**

Biomass energy: Biomass energy-classification- photosynthesis- biomass conversion process- gobar gas plants- wood gasification- ethanol from wood- advantages and disadvantages of biomass as energy source

UNIT – IV **(12 hours)**

Geothermal energy: Geothermal energy- wind energy- ocean thermal energy conversion (OTEC)-energy from waves and tides (basic ideas, nature, applications, merits and demerits)

UNIT – V **(12 hours)**

Energy storage and impacts of Non-conventional energy: Conversion of energy- patterns of energy consumption in domestic, industrial, transportation, agricultural sectors-conservation principles in these sectors- energy crisis and possible solutions- energy options for the developing countries- energy storage and hydrogen as a fuel (basics)-impact due to non-conventional energy sources-global warming

TEXT BOOKS:

1. Rajamaanar, 2004, Environmental Studies.

REFERENCE BOOKS:

1. Sukhatme, Solar Energy, McGraw-Hill Inc., US, 2nd Revised Edition,1997.

III B.Sc (PH)	PROJECT	JPH601
SEMESTER - VI		HRS/WK-5
PROJECT		CREDIT-4

Project on Electronics and Recent Trends in Physics

FORMAT FOR PREPARING PROJECT REPORT

Arrangement of contents

1. Title Page
2. Bonafide Certificate
3. Acknowledgement
4. Table of contents
5. Abstract
6. Chapters of the Report
7. References
8. Appendices, if any

Appendices should be named as APPENDIX –A
APPENDIX -B

BINDING SPECIFICATION

- Report should be found using flexible cover of thick white art paper.
- The Spine for the bound volume should be 2cms width.
- The Cover should be printed in block letters.

MARGIN SPECIFICATION

Top : 4 cms
Bottom : 3 cms
Left : 4.5 cms
Top : 2.5 cms

PAGE NUMBERING

All Page numbers should be typed without punctuation on the bottom-center portion of the page. The Preliminary pages (table of contents and abstract) should be numbered in lowercase roman literals.

Question Paper Pattern (as per your board of studies recommendations)

THEORY EXAMINATION

Continuous Internal Assessment (CIA) 25marks

1. Two Internal Examinations	15 marks
2. Assignment/ Seminar	5 marks
3. Attendance	5 marks
Total	**25 marks**

Semester Examination (75 marks)

B. Sc. Physics

Time: 3Hrs **Max. Marks: 75**

Section – A (10 X 2 = 20)

(Answer all the questions)

(Two questions from each unit)

Section – B (5 X 5 = 25)

(Answer all the questions)

(One question from each unit; either or pattern and any two of the questions will be a problem; any one part)

Section – C (3 X 10 = 30)

(Answer any Three Questions out of five)

(One question from each unit and it may have subdivisions; the subdivisions may have problems)

PRACTICAL EXAMINATION

Continuous Internal Assessment (CIA) (40 marks)

Based on the periodical evaluation of record &20 marks
Experiments assessed by the staff in charge

Model Practical examination 20 marks

External Examination (60 marks)

Total Marks: 60

Time: 3 Hrs

Program	- 50marks
Record	- 10marks
Total	- 60marks