

(For the candidates admitted 2026 – 2027 onwards)

Course	CC1	Semester – I	Course Code: B1PH1
Course Title	PROPERTIES OF MATTER AND ACOUSTICS		
Credits - 5	Instruction Hours - 6		Medium: English and Tamil
Course Objectives	Study of the properties of matter leads to information which is of practical value to both the physicist and the engineers. It gives us information about the internal forces which act between the constituent parts of the substance. Students who undergo this course are successfully bound to get a better insight and understanding of the subject.		

UNITS	COURSE DETAILS
Unit-I	ELASTICITY: Hooke's law – stress-strain diagram – elastic constants –Poisson's ratio – relation between elastic constants and Poisson's ratio – work done in stretching and twisting a wire – twisting couple on a cylinder – rigidity modulus by static torsion– torsional pendulum (with and without masses)
Unit -II	BENDING OF BEAMS: Cantilever – expression for Bending moment – expression for depression at the loaded end of the cantilever – experiment to find Young's modulus – non-uniform bending – experiment to determine Young's modulus by Koenig's method – uniform bending – expression for elevation – experiment to determine Young's modulus using microscope
Unit -III	FLUID DYNAMICS: <i>Surface tension:</i> Definition – molecular forces– excess pressure over curved surface –determination of surface tension by Jaeger's method–variation of surface tension with temperature <i>Viscosity:</i> definition – streamline and turbulent flow – rate of flow of liquid in a capillary tube – Poiseuille's formula –corrections – terminal velocity and Stokes formula– variation of viscosity with temperature
Unit -IV	WAVES AND OSCILLATIONS: Simple Harmonic Motion (SHM) – differential equation of SHM – composition of two SHM in a straight line and at right angles – Lissajous figures- free, damped, forced vibrations. Laws of transverse vibration in strings – sonometer – determination of AC frequency using sonometer – determination of frequency using Melde's string apparatus
Unit-V	ACOUSTICS OF BUILDINGS AND ULTRASONICS: Intensity of sound – decibel – loudness of sound –reverberation – Sabine's reverberation formula – acoustic intensity – factors affecting the acoustics of buildings. <i>Ultrasonic waves:</i> production of ultrasonic waves – Piezoelectric crystal method – magnetostriction effect – application of ultrasonic waves
Text Books	1. D.S.Mathur, 2010, Elements of Properties of Matter, S.Chand& Co. 2. BrijLal& N. Subrahmanyam, 2003, Properties of Matter, S.Chand& Co 3. D.R.Khanna&R.S.Bedi, 1969, Textbook of Sound, AtmaRam& sons 4. BrijLal and N.Subrahmanyam, 1995, A Text Book of Sound, Second revised edition,Vikas Publishing House. 5. R.Murugesan,2012, <u>Properties of Matter</u> , S.Chand& Co.
Ref. books	1. C.J. Smith, 1960, General Properties of Matter, Orient Longman Publishers 2. H.R.Gulati, 1977, Fundamental of General Properties of Matter, Fifth edition,R. Chand & Co.

	3. A.P French, 1973, Vibration and Waves, MIT Introductory Physics, Arnold-Heinmann India.
Web Resources	1. https://www.biolinscientific.com/blog/what-are-surfactants-and-how-do-they-work 2. http://hyperphysics.phy-astr.gsu.edu/hbase/permot2.html 3. https://www.youtube.com/watch?v=gT8Nth9NWPM 4. https://www.youtube.com/watch?v=m4u-SuaSu1s&t=3s 5. https://learningtechnologyofficial.com/category/fluid-mechanics-lab/ 6. http://www.sound-physics.com/ 7. http://nptel.ac.in/courses/112104026/

COURSE OUTCOMES:

At the end of the course, the student will be able to:

CO1	Relate elastic behavior in terms of three moduli of elasticity and working of torsion pendulum.
CO2	Able to appreciate concept of bending of beams and analyze the expression, quantify and understand nature of materials.
CO3	Explain the surface tension and viscosity of fluid and support the interesting phenomena associated with liquid surface, soap films provide an analogue solution to many engineering problems.
CO4	Analyze simple harmonic motions mathematically and apply them. Understand the concept of resonance and to evaluate the frequency of vibration. Set up experiment to evaluate frequency of ac mains
CO5	Understand the concept of acoustics, importance of constructing buildings with good acoustics. Able to apply their knowledge of ultrasonics in real life, especially in medical field and assimilate different methods of production of ultrasonic waves

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Course Outcomes (COs)↓	Programme Outcomes (PO)					Programme Specific Outcomes(PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	2	3	2	2	2	2	3	2	2	2.3
CO-2	2	2	3	2	3	2	2	2	3	2	2.3
CO-3	3	2	2	3	3	2	3	2	2	2	2.4
CO-4	3	2	2	2	3	2	2	3	2	2	2.3
CO-5	2	2	3	2	2	3	2	2	2	3	2.2
Mean Overall Score											2.3(High)

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

Question Paper Pattern

Maximum Marks: 70 Marks

Exam Duration: 3 Hrs

Part-A 10×2=20 Marks Answer ALL Questions (Two questions from each unit)

Part-B 5×4=20 Marks Answer ALL Questions (Either or Type-Two questions from each unit)

Part-C 3×10=30 Marks Answer Any Three Questions (Three out of Five-one question from each unit)

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	CC2	Semester – I	Course Code: B1PH2P
Course Title	PHYSICS PRACTICAL - I		
Credits -3	Instruction Hours - 3		Medium: English and Tamil
Course Objectives	Apply various physics concepts to understand Properties of Matter, set up experimentation to verify theories, quantify and analyse, able to do error analysis and correlate results.		

List of Experiments
Minimum of Seven Experiments from the list: 1. Determination of Young's modulus – Non Uniform bending – Pin and Microscope. 2. Determination of Young's modulus – Non Uniform bending – Scale and Telescope. 3. Determination of surface tension and interfacial surface tension by drop weight method. 4. Verification of laws of transverse vibration using sonometer. 5. Determination of velocity of sound through a wire using sonometer. 6. Coefficient of viscosity of liquid- Poiseuille's flow method. 7. Newton's law of cooling – Specific heat capacity of a given liquid. 8. Determination of thermal conductivity of bad conductor by Lee's disc method. 9. Determination of Stefan's constant for Black body radiation. 10. Melde's string – Determination of frequency of a given tuning fork – Longitudinal and Transverse modes. 11. Spectrometer – Refractive index of the solid prism. 12. Newton's rings-Determination of radius of curvature of a convex lens. 13. Metre bridge – Determination of resistance of a coil. 14. Potentiometer – Calibration of low range voltmeter. 15. Characteristics of Junction diode. 16. Logic gates (AND, OR and NOT) – Using discrete components.

OUTCOMES

1. Verify the theoretical concepts in physics through experiments.
2. Understand the behavior of thermal properties of materials.
3. Understand the basic laws and theories to determine various properties of materials.
4. Acquire knowledge about the characteristics of junction and Zener diodes.
5. Understand the operation of basic logic gates.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Course Outcomes (COs)↓	Programme Outcomes (PO)					Programme Specific Outcomes(PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	2	3	2	2	2	2	2	2	3	2.3
CO-2	2	2	1	2	3	3	2	3	2	2	2.2
CO-3	3	3	3	2	3	2	2	2	2	2	2.4
CO-4	3	2	2	2	3	2	2	3	2	2	2.3
CO-5	2	3	3	2	2	3	2	2	3	2	2.3
Mean Overall Score											2.3 (High)

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	CC3	Semester – II	Course Code: B2PH3
Course Title	HEAT, THERMODYNAMICS AND STATISTICAL PHYSICS		
Credits - 5	Instruction Hours - 6		Medium: English and Tamil
Course Objectives	The course focuses to understand a basic in conversion of temperature in Celsius, Kelvin and Fahrenheit scales. Practical exhibition and explanation of transmission of heat in good and bad conductor. Relate the laws of thermodynamics, entropy in everyday life and explore the knowledge of statistical mechanics and its relation		

UNITS	COURSE DETAILS
Unit - I	HEAT TRANSFER: <i>Conduction:</i> Thermal conductivity – determination of thermal conductivity of a good conductor by Forbe’s method – determination of thermal conductivity of a bad conductor by Lee’s disc method. <i>Radiation:</i> Black body radiation (Ferry’s method) – distribution of energy in black body radiation – Wien’s law and Rayleigh Jean’s law –Planck’s law of radiation – Stefan’s law – deduction of Newton’s law of cooling from Stefan’s law.
Unit - II	CALORIMETRY: Specific heat capacity – specific heat capacity of gases C_p & C_v – Meyer’s relation – Joly’s method for determination of C_v – Regnault’s method for determination of C_p LOW TEMPERATURE PHYSICS: Joule-Kelvin effect – porous plug experiment – Joule-Thomson effect – Boyletemperature – temperature of inversion – liquefaction of gas by Linde’s Process – adiabatic demagnetisation.
Unit - III	THERMODYNAMICS-I: Zeroth law and first law of thermodynamics –Isothermal and adiabatic processes– P-V diagram – heat engine –efficiency of heat engine – Carnot’s engine, construction, working and efficiency of petrol engine and diesel engines – comparison of engines.
Unit - IV	THERMODYNAMICS-II: Second law of thermodynamics – entropy change in reversible and irreversible processes – T-S diagram –thermodynamical scale of temperature – Maxwell’s thermodynamical relations –Clasius-Clapeyron’s equation (first latent heat equation) – third law of thermodynamics.
Unit - V	STATISTICAL MECHANICS: Definition of phase-space – micro and macro states – ensembles –different types of ensembles – classical and quantum Statistics – Maxwell-Boltzmann statistics – expression for distribution function – Bose-Einstein statistics – expression for distribution function – Fermi-Dirac statistics –expression for distribution function – comparison of three statistics.
Text Books	1. Brijlal&N. Subramaniam, 2000, Heat and Thermodynamics, S.Chand& Co. 2. Narayanamoorthy&KrishnaRao, 1969,Heat,Triveni Publishers, Chennai. 3. V.R.Khanna&R.S.Bedi, 1998 1 st Edition, Text book of Sound, Kedharnaath Publish & Co, Meerut 4. Brijlal and N. Subramanyam, 2001, Waves and Oscillations,Vikas Publishing House, New Delhi. 5. Ghosh, 1996, Text Book of Sound, S.Chand&Co. 6. R.Murugesan&KiruthigaSivaprasath, Thermal Physics, S.Chand& Co.

(For the candidates admitted 2026 – 2027 onwards)

Course	CC4	Semester – II	Course Code: B2PH4P
Course Title	PHYSICS PRACTICAL – II		
Credits – 3	Instruction Hours - 3		Medium: English and Tamil
Course Objectives	Apply their knowledge gained about the concept of heat and sound waves, resonance, calculate frequency of ac mains set up experimentation to verify theories, quantify and analyse, able to do error analysis and correlate results.		

Minimum of **Seven Experiments** from the list:

1. Determination of Young's modulus – Uniform bending – Pin and Microscope.
2. Determination of Young's modulus – Uniform bending – Scale and Telescope.
3. Surface tension by capillary rise method.
4. Sonometer- Determination of frequency of a given tuning fork.
5. Determination of velocity of sound using Kunds tube.
6. Comparison of viscosities of the given two liquids.
7. Determination of specific heat capacity of solid.
8. Determination of thermal conductivity of good conductor by Searle's method.
9. Verification of Stefan's-Boltzmann's law.
10. Determination of frequency of an electrically maintained tuning fork
11. Spectrometer – Hollow prism- μ of a given liquid.
12. Air Wedge- Determination of thickness of a thin wire.
13. Meter bridge – Verification of laws of resistance
14. Potentiometer –Ammeter Calibration
15. Characteristics of Zener diode.
16. Logic gates (AND, OR, NOT, NAND, NOR, EXOR) – Using ICs.
17. Determination of g using compound pendulum.

OUTCOMES

1. Verify the theoretical concepts in physics through experiments.
2. Understand the behaviour of thermal properties of materials.
3. Apply the knowledge of the fundamentals of physics in electricity, electronics and sound through experiments.
4. Understand the basic operation of logic gates through IC's.
5. Frequency of a given tuning fork is calculated by the transverse and longitudinal modes.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Course Outcomes (COs)↓	Programme Outcomes (PO)					Programme Specific Outcomes(PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	2	3	2	1	3	3	3	2	1	2.3
CO-2	3	3	3	2	1	3	3	2	2	1	2.3
CO-3	3	3	3	2	1	3	2	3	2	1	2.3
CO-4	3	3	2	3	1	3	3	3	2	1	2.3
CO-5	3	3	2	2	1	3	3	2	2	1	2.3
Mean Overall Score											2.3 (High)

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
25	75	100	

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	CC5	Semester – III	Course Code: B3PH5
Course Title	MECHANICS		
Credits -5	Instruction Hours - 6		Medium: English and Tamil
Course Objectives	This course allows the students: To have a basic understanding of the laws and principles of mechanics; To apply the concepts of forces existing in the system; To understand the forces of physics in everyday life; To visualize conservation laws; To apply Lagrangian equation to solve complex problems.		

UNITS	COURSE DETAILS
Unit - I	LAWS OF MOTION: Newton's Laws – forces – equations of motion – projectile motion-path of a projectile- Impulse- Impact – Laws of Impact – Impulsive force – Direct and oblique impact between two smooth spheres – Impact of a smooth sphere on a fixed horizontal plane – Motion of two interacting bodies.
Unit - II	RIGID BODY DYNAMICS: Translational and rotational motion – angular momentum – moment of inertia – general theorems of moment of inertia – examples – rotation about fixed axis – kinetic energy of rotation – examples – body rolling along a plane surface – body rolling down an inclined plane – gyroscopic precision – gyrostatic applications.
Unit - III	CONSERVATION LAWS OF ENERGY AND MOMENTUM Introduction – significance of conservation laws – law of conservation of energy concepts of work- power – energy – conservative forces Law of conservation of momentum – Center of mass - System of variable mass- Equation of Rocket motion – conservation of linear and angular momentum.
Unit - IV	GRAVITATION: Newton's law of gravitation – Determination of G Boy's method – Intensity of gravitational field – Kepler's law of Gravitation - Equipotential surface – Acceleration due to gravity (g) - Variation of 'g' with Altitude, Depth and Latitude. Seismology: Earth quakes – seismic waves – Determination of epicenter and focus – Modern applications of seismology..
Unit - V	LAGRANGIAN MECHANICS: Generalized coordinates –degrees of freedom – constraints - principle of virtual work and D' Alembert's Principle –Lagrange's equation from D' Alembert's principle – application –simple pendulum – Atwood's machine.
Text Books	1. J.C. Upadhyaya, 2019, Classical Mechanics, Himalaya Publishing house, Mumbai. 2. P. DuraiPandian, LaxmiDuraiPandian, MuthamizhJayapragasam,2005, Mechanics, 6 th revised edition, S.Chand& Co. 3. D. S. Mathur & P. S. Hemne, 2000, Mechanics, Revised Edition, S.Chand& Co. 4. Narayanamurthi, M. &Nagarathnam. N, 1998, Dynamics. The National Publishing,Chennai. 5. Narayanamurthi, M. and Nagarathnam, N, 1982, Statics, Hydrostatics and Hydrodynamics, The National Publishers, Chennai.
Ref. books	1. Goldstein Herbert, 1980, Classical Mechanics. U.S.A: Addison and Wesley. 2. Halliday, David & Robert, Resnick, 1995, Physics Vol.I. New Age, International, Chennai.

	3. Halliday, David Robert Resnick and Walker Jearl, 2001, Fundamentals of Physics, John Wiley, New Delhi
Web Resources	1. https://youtu.be/X4_K-XLUIB4 2. https://nptel.ac.in/courses/115103115 3. https://www.youtube.com/watch?v=p075LPq3Eas 4. https://www.youtube.com/watch?v=mH_pS6fruyg 5. https://onlinecourses.nptel.ac.in/noc22_me96/preview 6. https://www.youtube.com/watch?v=tdkFc88Fw-M 7. https://onlinecourses.nptel.ac.in/noc21_me70/preview

COURSE OUTCOMES:

At the end of the course, the student will be able to:

CO1	Understand the Newton's Law of motion and to realize the basic principles behind planetary motion.
CO2	Kepler's laws and understand the basic concepts of gravitation and seismology.
CO3	Apply conservation law and calculate energy of various systems, understand and differentiate conservative forces
CO4	Gain knowledge on rigid body dynamics and solve problems based on this concept
CO5	Appreciate Lagrangian system of mechanics, apply D' Alemberts principle

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Course Outcomes (COs)↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	2	3	2	1	3	3	3	2	1	2.3
CO-2	3	2	3	2	1	3	3	2	3	1	2.3
CO-3	3	3	2	2	2	3	3	2	1	1	2.2
CO-4	3	3	2	3	1	3	3	3	2	1	2.4
CO-5	3	3	3	2	1	3	3	2	2	1	2.3
Mean Overall Score											2.3 (High)

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

Question Paper Pattern

Maximum Marks: 70 Marks

Exam Duration: 3 Hrs

Part-A 10×2=20 Marks Answer ALL Questions (Two questions from each unit)

Part-B 5×4=20 Marks Answer ALL Questions (Either or Type-Two questions from each unit)

Part-C 3×10=30 Marks Answer Any Three Questions (Three out of Five-one question from each unit)

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	CC6	Semester - III	Course Code: B3PH6P
Course Title	PHYSICS PRACTICAL – III		
Credits - 3	Instruction Hours – 3		Medium: English and Tamil
Course Objectives	Construct circuits to learn about the concept of electricity, current, resistance in the path of current, different parameters that affect a circuit. Set up experiments, observe, analyse and assimilate the concept		

Minimum of **Eight Experiments** from the list:

1. Young's Modulus –Cantilever (Pin and Microscope).
2. Rigidity Modulus – Static Torsion.
3. Measurement of low resistances using potentiometer.
4. Determination of internal resistance of a cell using potentiometer.
5. Determination of resistance and specific resistance using Carey Foster's bridge.
6. LCR – Parallel resonance circuit – Self inductance and quality factor of a coil.
7. Specific heat capacity of a given liquid – Joule's calorimeter.
8. Spectrometer- Grating- Normal Incidence method – Wavelength determination.
9. Verification of Newton's formula for a lens separated by a distance.
10. Tan A and Tan B position- Magnetic moments of a given magnet.
11. Field along the axis of a coil- H determination.
12. Determination of figure of merit of Table galvanometer.
13. Transistor characteristics – CB Configuration.
14. Verification of De Morgan's Theorems.
15. Determination of wavelengths, particle size using Laser/Monochromatic source.

OUTCOMES

1. To understand the fundamentals of physics.
2. Verify the theoretical concepts in physics through experiments.
3. Understand the behavior of thermal properties of materials.
4. Apply the knowledge of the fundamentals of physics in electronics and electricity through experiments.
5. Understand the magnetic behavior of bar magnet in Tan A and Tan B positions.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Course Outcomes (COs)↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	2	2	2	3	3	3	2	2	2	2.4
CO-2	3	2	3	2	3	3	3	2	2	2	2.5
CO-3	3	3	2	2	2	3	3	2	2	2	2.4
CO-4	3	2	3	2	2	3	3	2	2	3	2.5
CO-5	3	2	2	3	3	3	3	2	3	3	2.7
Mean Overall Score											2.5 (High)

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	CC7	Semester – IV	Course Code: B4PH7
Course Title	OPTICS AND LASER PHYSICS		
Credits – 5	Instruction Hours – 6		Medium: English and Tamil
Course Objectives	To provide an in-depth understanding the various phenomena in geometrical and wave optics; To explain the behaviour of light in different mediums; To understand the differences in the important phenomena namely interference, diffraction and Polarization. To solve problems in optics by selecting the appropriate equations and performing numerical or analytical calculations.		

UNITS	COURSE DETAILS
Unit - I	GEOMETRICAL OPTICS Wave optics: Nature of light - Theories of light - Electromagnetic nature of light. Definition of a wave front - propagation of a wave front - Huygens principle of secondary wavelets. Defects of image: Monochromatic aberration and Chromatic aberration-Spherical aberration in a lens - Methods of minimizing the spherical aberration - Chromatic aberration in a lens - Condition for achromatism for two thin lenses in contact, separated by a distance.
Unit - II	INTERFERENCE: Division of wave front, Fresnel's biprism – fringes with white light – division of amplitude: interference in thin films due to, (i) reflected light, (ii) transmitted light – colours of thin films applications – air wedge – Newton's rings. <i>Interferometers</i> : Michelson's interferometer – applications -determination of the wavelength of a monochromatic source of light.
Unit - III	DIFFRACTION: Fresnel's assumptions – zone plate – action of zone plate for an incident spherical wave front – differences between a zone plate and a convex lens –Fresnel type of diffraction – diffraction pattern due to a straight edge – positions of maximum and minimum intensities – Fraunhofer type of diffraction – Fraunhofer diffraction at a single slit – plane diffraction grating– experiment to determine wavelengths – width of principal maxima.
Unit - IV	POLARISATION: Optical activity – optically active crystals –polarizer and analyser–double refraction – optic axis, principal plane – polaroids– circularly and elliptically polarized light – quarter wave plate – half wave plate – Fresnel's explanation – specific rotation – Laurent half shade polarimeter – experiment to determine specific rotatory power.
Unit - V	LASERS: General principles of lasers – properties of lasers action – spontaneous and stimulated emission – population inversion – optical pumping – He-Ne laser (principle and working) – CO ₂ laser (principle and working) semiconductor laser – laser applications – holography.
Text Books	1. Subramaniam. N and Brijlal, 2014, Optics, 25 th Ed, S.Chand and Co. 2. P.R.Sasikumar, 2012, Photonics, PHIPvt Ltd, New Delhi. 3. V.Rajendran, 2012, Engineering Physics, Tata McGraw Hill.
Ref. books	1. Sathyaprakash, 1990, Optics, VII edition, Ratan Prakashan Mandhir, New Delhi. 2. Ajoy Ghatak, 2009, Optics, 4 th edition, PHIPvt Ltd, New Delhi. 3. D.Halliday, R.Resnick and J. Walker, 2001, Fundamentals of Physics, 6 th edition, Wiley, New York. 4. Jenkins A.Francis and White, 2011, Fundamentals of Optics, 4th edition,

	McGraw Hill Inc., NewDelhi.
Web Resources	1. https://science.nasa.gov/ems/ 2. https://www.youtube.com/watch?v=tL3rNc1G0qQ&list=RDCMUCzwo7UIGkb-8Pr6svxWo-LA&start_radio=1&dt=2472 3. https://science.nasa.gov/ems/

COURSE OUTCOMES:

At the end of the course, the student will be able to:

CO1	Outline basic knowledge of methods of rectifying different defects in lenses and prisms, articulate technological applications of eyepieces
CO2	Discuss the principle of superposition of wave, use these ideas to understand the wave nature of light through working of interferometer
CO3	Extend the knowledge about nature of light through diffraction techniques; apply mathematical principles to analyse the optical instruments
CO4	Interpret basic formulation of polarization and gain knowledge about polarimeter, appraise its usage in industries
CO5	Acquire the knowledge of principle, working and applications of LASER

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Course Outcomes (COs)↓	Programme Outcomes (PO)					Programme Specific Outcomes(PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	2	2	3	2	3	3	3	2	2	2.5
CO-2	3	2	2	2	2	2	3	2	3	2	2.3
CO-3	3	3	3	3	2	3	3	3	1	2	2.6
CO-4	3	2	2	3	2	3	3	2	1	2	2.3
CO-5	3	2	2	2	2	3	3	2	1	2	2.2
Mean Overall Score											2.38 (High)

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

Question Paper Pattern

Maximum Marks: 70 Marks

Exam Duration: 3 Hrs

Part-A 10×2=20 Marks Answer ALL Questions (Two questions from each unit)

Part-B 5×4=20 Marks Answer ALL Questions (Either or Type-Two questions from each unit)

Part-C 3×10=30 Marks Answer Any Three Questions (Three out of Five-one question from each unit)

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	CC8	Semester – IV	Course Code: B4PH8P
Course Title	PHYSICS PRACTICAL -IV		
Credits – 3	Instruction Hours - 3		Medium: English and Tamil
Course Objectives	Demonstrate various optical phenomena principles, working, apply with various materials and interpret the results.		

Minimum of **Eight Experiments** from the list:

1. Young's Modulus – Cantilever (Scale and Telescope).
2. Torsional pendulum – Determination of Rigidity modulus (With and without symmetrical masses)
3. Potentiometer- Temperature co-efficient of a given coil.
4. Determination of range of motion using Searles goniometer.
5. Determination of specific resistance of the material of the wire using PO box.
6. LCR –Series resonance circuit- Self inductance and quality factor of a coil.
7. Specific heat capacity of a given solid – Method of mixtures.
8. Spectrometer –Grating –Minimum Deviation –Wavelength determination.
9. Determination of refractive index of a given liquid by forming liquid lens.
10. Tan C – Determination of M and H.
11. Field along the axis of a coil - Determination of Magnetic moment.
12. Comparison of EMF of two cells using BG Comparison of capacitance using BG.
13. Transistor characteristics – CE Configuration.
14. Verification of Boolean Laws.
15. Stokes method – Determination of the viscosity of a given liquid.

OUTCOMES

1. Verify the theoretical concepts in physics through experiments.
2. Understand the behavior of thermal properties of materials.
3. Understand the application of various experiments in our day to day life.
4. Apply the knowledge of the fundamentals of physics and instrumentation to arrive at solution for various problems.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Course Outcomes (COs)↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	2	2	2	3	3	3	2	2	2	2.4
CO-2	3	2	3	2	3	3	3	2	2	2	2.5
CO-3	3	3	2	2	2	3	3	2	2	2	2.4
CO-4	3	2	3	2	2	3	3	2	2	3	2.5
CO-5	3	2	2	3	3	3	3	2	3	3	2.7
Mean Overall Score											2.5 (High)

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	CC9	Semester – V	Course Code: B5PH9
Course Title	ELECTRICITY AND MAGNETISM		
Credits – 5	Instruction Hours - 5		Medium: English and Tamil
Course Objectives	To classify materials based on their electrical and magnetic properties. To analyse the working principles of electrical gadgets. To understand the behaviour of dc, ac and transient currents. To know about the communication by electromagnetic waves.		

UNITS	COURSE DETAILS
Unit - I	CAPACITORS AND THERMO ELECTRICITY: Capacitor –principle – capacitance of spherical and cylindrical capacitors –Loss of energy due to sharing of charges Seebeck effect – laws of thermo emf – Peltier effect – Thomson effect – thermoelectric diagrams –uses of thermoelectric diagrams – thermodynamics of thermo couple- determination of Peltier and Thomson coefficients.
Unit - II	MAGNETISM AND MAGNETIC EFFECTS OF CURRENT: Magnetic induction B – magnetization M - relation between B, H and M – magnetic susceptibility – magnetic permeability – experiment to draw B-H curve – energy loss due to hysteresis - Importance of hysteresis curves – properties of dia, para, ferro and ferri magnetic materials. Biot and Savart's law – magnetic induction due to circular coil – magnetic induction due to solenoid –moving coil galvanometer – damping correction – Ampere’s circuital law – differential form.
Unit - III	ELCTROMAGNETIC INDUCTION: Faraday and Lenz laws –vector form – self-induction – coefficient of self-inductance of solenoid – Experimental determination of self inductance - Rayleigh’s method – mutual induction – coefficient of mutual inductance between two coaxial solenoids – Experimental determination of mutual inductance between two coils –coefficient of coupling constant.
Unit - IV	TRANSIENT AND ALTERNATING CURRENTS: Growth and decay of current in a circuit containing R and L – growth and decay of charge in a circuit containing R and C – growth and decay of charge in an LCR circuit (expressions for charge only) – peak, average and RMS values of ac – LCR series and parallel circuits – resonance condition – Q factor – power factor.
Unit - V	MAXWELL'S EQUATIONS AND ELECTROMAGNETIC WAVE PROPAGATION: Maxwell’s equations in vacuum, material media– physical significance of Maxwell’s equations – displacement current – plane electromagnetic waves in free space – velocity of light – Pointing vector–electromagnetic waves in a linear homogenous media – refractive index.

Text Books	1. Murugesan. R., - Electricity and Magnetism, 8thEdn, 2006, S.Chandand Co, New Delhi. 2. Sehgal D.L., Chopra K.L, Sehgal N.K., - Electricity and Magnetism, 3. Sultan Chand and Sons, New Delhi. 4. M. Narayanamurthy and N. Nagarathnam, Electricity and Magnetism, 4th Edition. 5. National Publishing Co., Meerut.
Ref. books	1. Brijlal and Subramanian, Electricity and Magnetism, 6th Edn.,RatanandPrakash, Agra. 2. Brijlal, N.Subramanyan and JivanSeshan, Mechanics and Electrodynamics (2005), 3. Eurasia Publishing House (Pvt.) Ltd., New Delhi. 4. David J. Griffiths, Introduction to Electrodynamics, 2ndEdn. 1997, Prentice Hall of India Pvt. Ltd., New Delhi
Web Resources	1. https://www.edx.org/course/electricity 2. https://www.udemy.com/courses/ electricity 3. https://www.edx.org/course/magnetism 4. http://www.hajim.rochester.edu/optics/undergraduate/courses.html

COURSE OUTCOMES:

At the end of the course, the student will be able to:

CO1	Describe various thermo-electric effects and their properties.
CO2	Apply Biot and Savart law to study the magnetic effect of electric current.
CO3	Use Faraday and Lenz laws in explaining self and mutual inductance.
CO4	Analyze the time variation of current and potential difference in AC circuits.
CO5	Describe Maxwell's equations and electromagnetic waves.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Course Outcomes (COs)↓	Programme Outcomes (PO)					Programme Specific Outcomes(PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	2	3	2	3	2	3	2	3	2	1	2.3
CO-2	3	3	2	2	3	3	2	2	2	1	2.3
CO-3	3	2	2	3	3	2	3	3	2	1	2.4
CO-4	3	2	2	3	3	2	2	3	2	1	2.3
CO-5	3	3	2	3	3	2	2	3	2	1	2.3
Mean Overall Score											2.32(High)

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

Question Paper Pattern

Maximum Marks: 70 Marks

Exam Duration: 3 Hrs

Part-A 10×2=20 Marks Answer ALL Questions (Two questions from each unit)

Part-B 5×4=20 Marks Answer ALL Questions (Either or Type-Two questions from each unit)

Part-C 3×10=30 Marks Answer Any Three Questions (Three out of Five-one question from each unit)

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	CC10	Semester – V	Course Code: B5PH10
Course Title	ATOMIC AND NUCLEAR PHYSICS		
Credits – 5	Instruction Hours - 5		Medium: English and Tamil
Course Objectives	To make students understand the development of atom models, quantum numbers, coupling schemes and analysis of magnetic moments of an electrons; To gain knowledge on excitation and ionization potentials, splitting of spectral lines in magnetic and electric fields; To get knowledge on radioactive decay; To know the concepts used in nuclear reaction; to understand the quark model of classification of elementary particles.		

UNITS	COURSE DETAILS
Unit - I	VECTOR ATOM MODEL: Introduction to atom model – vector atom model – electron spin – spatial quantization – quantum numbers associated with vector atom model – L-S and J-J coupling – Pauli's exclusion principle – magnetic dipole moment due to orbital motion and spin motion of the electron – Bohr magneton – Stern-Gerlach experiment.
Unit - II	ATOMIC SPECTRA: Origin of atomic spectra – excitation and ionization potentials – Davis and Goucher's method – spectral terms and notations – fine structure of sodium D-lines – Zeeman effect – Larmor's theorem – quantum mechanical explanation of normal Zeeman effect – anomalous Zeeman effect (qualitative explanation) – Paschen-Back effect – Stark effect (Definition only)
Unit - III	RADIOACTIVITY: Discovery of radioactivity – natural radio activity – properties of alpha rays, beta rays and gamma rays – Geiger-Nuttall law – alpha particle spectra – Gammow's theory of alpha decay (qualitative study) – beta ray spectra – neutrino theory of beta decay – nuclear isomerism – internal conversion.
Unit - IV	NUCLEAR REACTIONS: Conservation laws of nuclear reaction – Q-value equation for a nuclear reaction – threshold energy – scattering cross section – artificial radio activity – application of radio isotopes – models of nuclear structure – liquid drop model – shell model.
Unit - V	ELEMENTARY PARTICLES: Classification of elementary particles – fundamental interactions – elementary particle quantum numbers – Isospin and strangeness quantum number – Conservation laws and symmetry – quarks – quark model (elementary ideas only) – discovery of cosmic rays – primary and secondary cosmic rays.
Text Books	1. R. Murugesan, Modern Physics, S. Chand and Co. (All units) (Units I and II-Problems) 2. Brijlal and N. Subrahmanyam, Atomic and Nuclear Physics, S. Chand and Co. (All units) 3. J. B. Rajam, Modern Physics, S. Chand and Co. 4. Sehgal and Chopra, Modern Physics, Sultan Chand, New Delhi 5. Arthur Beiser– Concept of Modern Physics, McGraw Hill Publication, 6 th Edition.
Ref. books	1. Perspective of Modern Physics, Arthur Beiser, McGraw Hill. 2. Modern Physics, S. Ramamoorthy, National Publishing and Co.

	3. Laser and Non-Linear Optics by B.B.Laud, Wiley Easter Ltd.,NewYork,1985. 4. Tayal, D.C.2000 – Nuclear Physics, Edition, Himalaya Publishing House, Mumbai.
Web Resources	1. http://hyperphysics.phy-astr.gsu.edu/hbase/hframe.html 2. https://makingphysicsfun.files.wordpress.com/2015/01/photoelectric-effect.pptx 3. https://www.khanacademy.org/science/in-in-class-12th-physics-india/nuclei

COURSE OUTCOMES:

At the end of the course, the student will be able to:

CO1	Describe various models that explain about the nuclear structures
CO2	Understand atomic spectra.
CO3	Give reason for various kinds of radioactivity and also know laws governing them
CO4	Discuss the concepts used in nuclear reaction.
CO5	Classify various elementary particles and study the effect of cosmic rays.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Course Outcomes (COs)↓	Programme Outcomes (PO)					Programme Specific Outcomes(PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	2	2	2	2	3	3	2	3	2	2.4
CO-2	3	1	3	1	2	3	2	3	3	2	2.3
CO-3	3	2	2	2	2	3	2	3	2	2	2.3
CO-4	3	2	3	2	2	3	3	2	2	2	2.4
CO-5	2	2	2	2	2	3	3	2	3	2	2.3
Mean Overall Score											2.34 (High)

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

Question Paper Pattern

Maximum Marks: 70 Marks

Exam Duration: 3 Hrs

Part-A 10×2=20 Marks Answer ALL Questions (Two questions from each unit)

Part-B 5×4=20 Marks Answer ALL Questions (Either or Type-Two questions from each unit)

Part-C 3×10=30 Marks Answer Any Three Questions (Three out of Five-one question from each unit)

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	CC11	Semester – V	Course Code: B5PH11
Course Title	ANALOG AND COMMUNICATION ELECTRONICS		
Credits – 4	Instruction Hours - 5		Medium: English and Tamil
Course Objectives	To study the design, working and applications of semiconducting devices. To construct various electronic circuits. To study them in details. To study the basis of audio and video communication systems and the aspects of satellite and Fibre Optic Communications.		

UNITS	COURSE DETAILS
Unit - I	DIODES: Junction diode characteristics – rectifiers -half wave rectifier, center tapped and bridge full wave rectifiers, calculation of efficiency and ripple factor. DC power supply: Block diagram of a power supply and its working - Zener diode as voltage regulator.
Unit - II	TRANSISTOR AMPLIFIERS: Transistor configurations: CB, CE CC modes – I-V characteristics and hybrid parameters – DC load line – Q point self-bias – RC coupled CE amplifier – power amplifiers – classification of power amplifiers: A, B, C – push pull amplifiers.
Unit - III	TRANSISTOR OSCILLATORS: Feedback amplifier - principle of feedback, positive and negative feedback of voltage and current gain, advantages of negative feedback - Barkhausen's criterion. Transistor oscillators: Hartely, Colpitt, Phase shift oscillators with mathematical analysis.
Unit - IV	INTEGRATED CIRCUITS AND OPERATIONAL AMPLIFIERS: Integrated circuits – Classifications – Fabrication of basic monolithic IC. Differential amplifiers – OPAMP characteristics –IC 741 pin configuration – inverting and non-inverting amplifiers – unity follower –summing and difference amplifiers – differentiator and integrator.
Unit - V	MODULATION AND DEMODULATION: Theory of amplitude modulation - frequency modulation – comparison of AM and FM – phase modulation – sampling theorem – pulse width modulation – pulse modulation systems: PAM, PPM and PCM(Definitions only) – demodulation: AM and FM detection.
Text Books	1. V.K.Mehta - Principles of Electronics, S.Chand and Co. Ltd., 2004. 2. V.Vijayendran - Integrated Electronics, S.Vishwanathan Publishers. 3. B.L. Theraja - A Text Book of Electrical Technology. 4. John D. Ryder - Electronic fundamentals and Applications. 5. Malvino - Electronic Principles, Tata McGraw Hill.
Ref. books	1. B. Grob - Basic Electronics, 6 th edition, McGraw Hill, NY, 1989. 2. Herbert Taub and Donald schilling - Digital Integrated Electronics, McGraw Hill, NY. 3. Ramakant A. – Op amp principles and linear integrated circuits, Gaykward 4. Bagde and S. P. Singh - Elements of Electronics. 5. Millman and Halkias- Integrated Electronics, Tata McGraw Hill.
Web Resources	1. https://www.queenmaryscollege.edu.in/eresources/undergraduateprogram/py157

	2. www.ocw.mit.edu >...> Circuits and Electronics 3. www.ocw.mit.edu >...> Introductory Analog Electronics Laboratory 4. https:// www.elprocus.com > semiconductor devices 5. https:// www.britannica.com >technology
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COURSE OUTCOMES:

At the end of the course, the student will be able to:

CO1	Explain the basic concepts of semiconductors devices.
CO2	know and classify the basic principles of biasing and transistor amplifiers
CO3	Acquire the fundamental concepts of oscillators.
CO4	Understand the working of operational amplifiers
CO5	Learn and analyze the theory of various modulations and demodulations.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Course Outcomes (COs)↓	Programme Outcomes (PO)					Programme Specific Outcomes(PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	3	3	2	2	3	3	2	2	2	2.5
CO-2	3	3	2	2	2	3	3	3	3	2	2.6
CO-3	3	3	2	2	2	3	3	3	2	2	2.5
CO-4	3	3	2	2	2	3	3	3	2	2	2.5
CO-5	3	3	2	2	2	3	3	3	2	2	2.5
Mean Overall Score											2.52 (High)

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

Question Paper Pattern

Maximum Marks: 70 Marks

Exam Duration: 3 Hrs

Part-A 10×2=20 Marks Answer ALL Questions (Two questions from each unit)

Part-B 5×4=20 Marks Answer ALL Questions (Either or Type-Two questions from each unit)

Part-C 3×10=30 Marks Answer Any Three Questions (Three out of Five-one question from each unit)

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	CC12	Semester – V	Course Code: B5PH12P
Course Title	PHYSICS PRACTICAL –V		
Credits -3	Instruction Hours - 6		Medium: English and Tamil
Course Objectives	Demonstrate various optical phenomena principles, working, apply with various materials and interpret the results.		

Minimum of **Twelve Experiments** from the list:

1. Young's Modulus - Koenig's method-Non-Uniform Bending.
2. Potentiometer – E.M.F of a thermocouple.
3. Potentiometer- Calibration of high range voltmeter.
4. Carey Foster's Bridge –Temperature co-efficient of resistance of a coil.
5. B.G. – Comparison of capacitances
6. Spectrometer- (i-d) curve.
7. Spectrometer – Small angled prism.
8. Spectrometer – Dispersive power of grating
9. Transistor –Single Stage Amplifier.
10. Hartley Oscillator – Frequency and Self-inductance (L).
11. Astable multivibrator – Transistor.
12. FET- Characteristics.
13. Half Adder, Full Adder using basic logic gates-IC.
14. NAND universal gate – Verification.
15. Regulated power supply using Zener diode – percentage of regulation.
16. Study of Flip Flops.
17. Microprocessor – 8 bit addition and subtraction.(8-bit)
18. Microprocessor 8085 – multiplication (8 bit)
19. Microprocessor 8085 – division (8 bit)
20. C - Programming – Conversion of Centigrade to Fahrenheit.
21. C - Programming – Calculation of Simple Interest.

OUTCOMES

By the end of the course, the student will be able to

1. Verify the theoretical concepts in physics through experiments.
2. Understand the behavior of thermal properties of materials.
3. Understand the validity of basic laws and theories to determine various properties of materials.
4. Gain knowledge about FET characteristics.
5. Understand about the various digital circuits.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Course Outcomes (COs)↓	Programme Outcomes (PO)					Programme Specific Outcomes(PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	3	3	2	2	3	3	3	3	2	2.7
CO-2	3	3	3	2	2	3	3	3	3	2	2.7
CO-3	3	3	3	2	2	3	3	3	3	2	2.7
CO-4	3	3	2	2	2	3	3	3	3	2	2.6
CO-5	3	3	2	2	2	3	3	3	3	2	2.6
Mean Overall Score											2.66 (High)

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	CC13	Semester – VI	Course Code: B6BP13
Course Title	QUANTUM MECHANICS AND RELATIVITY		
Credits – 5	Instruction Hours - 6		Medium: English and Tamil
Course Objectives	To understand the theory of relativity, its postulates and the consequences. To learn the importance of transformation equations and also to differentiate between special and general theory of relativity. To interpret the wave theory of matter with various theoretical and experimental evidences. To derive and use Schrodinger’s wave equation and also learn about various operators. To solve Schrodinger’s wave equation for simple problems and analyse to understand the solutions.		

UNITS	COURSE DETAILS
Unit - I	MATTER WAVES: Inadequacy of classical physics and origin of quantum theory – Einstein's photoelectric equation – Compton effect – De Broglie waves – phase velocity and group velocity – Davisson and Germer's experiment – uncertainty principle – consequences – illustration of Gamma ray microscope.
Unit - II	OPERATORS AND SCHRÖDINGER EQUATION: postulates of quantum mechanics – Wave function and its interpretation – Schrödinger's equation – linear operators – Eigenvalue – operators for position, linear Momentum, angular momentum components – expectation values of position and momentum.
Unit - III	SOLVING SCHRÖDINGER EQUATION FOR SIMPLE PROBLEMS: Particle in a box - barrier penetration problem - linear harmonic oscillator - Rigid rotator - Hydrogen atom - Electron Microscope - Hermitian operators and their properties.
Unit - IV	SPECIAL THEORY OF RELATIVITY: Michelson-Morley experiment–frames of reference – Galilean Relativity – postulates of special theory of relativity – Lorentz transformation – consequences – time dilation–concept of simultaneity – Doppler effect – length contraction–variation of mass with velocity – Einstein's mass-energy relation.
Unit - V	TRANSFORMATION RELATIONS: Transformation of velocity, mass, energy and momentum – four vector – invariance under transformation – Lorentz transformation and velocity addition equations in terms of hyperbolic functions. GENERAL THEORY OF RELATIVITY: Inertial and Gravitational mass – Principle of equivalence – Experimental evidences for General theory of Relativity
Text Books	1. Modern Physics, R. Murugesan, Kiruthiga Sivaprasath, S. Chand and Co., 17 th Revised Edition, 2014. 2. Concepts of Modern Physics, A. Beiser, 6 th Ed., McGraw-Hill, 2003. 3. Special Theory of Relativity, S.P. Puri, Pearson Education, India, 2013. 4. Quantum mechanics–Satyaprakash and Swati Saluja. Kedar Nath Ram Nath and

Ref. books	1. Quantum Mechanics, V. Devanathan, Narosa Pub. House, Chennai, 2005. 2. Quantum Mechanics, V.K. Thangappan, New Age International, New Delhi. 3. A Text Book of Quantum Mechanics, Mathews and Venkatesan, Tata McGraw Hill, New Delhi. 4. Introduction to Quantum Mechanics, Pauling and Wilson, McGraw Hill Co., New York.
Web Resources	1. http://hyperphysics.phy-astr.gsu.edu/hbase/qapp.html 2. https://swayam.gov.in/nd2_ap83/preview 3. https://swayam.gov.in/nd1_noc20_ph05/preview 4. https://www.khanacademy.org/science/physics/special-relativity/minkowski-spacetime/v/introduction-to-special-relativity-and-minkowski-spacetime-diagrams

COURSE OUTCOMES:

At the end of the course, the student will be able to:

CO1	Realise the wave nature of matter and understand its importance
CO2	Understand the Schrodinger equation and also realize the use of operators.
CO3	Know the applications of Schrödinger equation to simple problems.
CO4	Understand various postulates of special theory of relativity.
CO5	Appreciate the importance of transformation equations and also the general theory of relativity.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Course Outcomes (COs)↓	Programme Outcomes (PO)					Programme Specific Outcomes(PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	3	2	2	2	3	2	2	2	2	2.3
CO-2	3	3	3	2	2	3	2	2	2	1	2.3
CO-3	3	3	2	3	2	3	3	2	2	1	2.4
CO-4	3	3	3	3	2	3	3	2	2	1	2.5
CO-5	3	3	2	3	2	2	3	2	2	3	2.5
Mean Overall Score											2.4 (High)

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

Question Paper Pattern

Maximum Marks: 70 Marks

Exam Duration: 3 Hrs

Part-A 10×2=20 Marks Answer ALL Questions (Two questions from each unit)

Part-B 5×4=20 Marks Answer ALL Questions (Either or Type-Two questions from each unit)

Part-C 3×10=30 Marks Answer Any Three Questions (Three out of Five-one question from each unit)

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	CC14	Semester – VI	Course Code: B6PH14
Course Title	DIGITAL ELECTRONICS AND MICROPROCESSOR 8085		
Credits – 4	Instruction Hours - 6		Medium: English and Tamil
Course Objectives	To learn all types of number systems, Boolean algebra and identities, digital circuits for addition and subtraction, flip-flops, registers, counters. To get the knowledge on fundamentals of 8085 architecture, instruction sets and simple programs.		

UNITS	COURSE DETAILS
Unit - I	NUMBER SYSTEMS AND DIGITAL LOGIC FUNDAMENTALS: Decimal, binary, octal, hexadecimal numbers systems and their conversions codes: BCD, gray and excess-3 codes – ASCII codes - complements (1's, 2's) – binary addition, binary subtraction using 1's & 2's complement methods – Boolean laws – De-Morgan's theorem –basic logic gates -universal logic gates (NAND & NOR) – Karnaugh map (SOP).
Unit - II	COMBINATIONAL LOGIC CIRCUITS: Adders: half & full adder – Subtractors: half & full subtractor – magnitude comparator (basics only) – multiplexers (4:1) & demultiplexers (1:4), encoder (8-line-to-3- line) and decoder (3-line-to-8-line), BCD to seven segment decoder.
Unit - III	SEQUENTIAL LOGIC CIRCUITS: Flip-flops: S-R Flip-flop , J-K Flip-flop, T and D type flip-flops, master-slave flip-flop, truth tables, registers:- serial in serial out and parallel in and parallel out – counters asynchronous:- mod-10, synchronous - 4-bit & ring counter.
Unit - IV	8085 MICROPROCESSOR ARCHITECTURE AND INSTRUCTION SET: 8085 Microprocessor: introduction to microprocessor – INTEL 8085 architecture – register organization –pin configuration of 8085, interrupts and its priority – Program Status Word (PSW) –instruction set of 8085 –addressing modes of 8085.
Unit - V	8085 ASSEMBLY LANGUAGE PROGRAMMING: Assembly language programming using 8085 –programmes for addition (8-Bit & 16-Bit), subtraction (8-Bit & 16-Bit), multiplication (8- Bit), division (8- Bit) – largest and smallest number in an array – Square of a number (8-bit) –Square root of a number (8-bit) – Ascending and Descending order of an array (8-bit).
Text Books	1. M.Morris Mano, "Digital Design "3rd Edition, PHI, NewDelhi. 2. Ronald J. Tocci. "Digital Systems-Principles and Applications" 6/e. PHI. New Delhi. 1999.(UNITS I to IV) 3. S.Salivahana& S. Arivazhagan-Digital circuits and design 4. Microprocessor Architecture, Programming and Applications with the 8085 – Penram International Publishing, Mumbai.- Ramesh S.Gaonakar 5. Fundamentals of Microprocessor and Microcomputers – B. RAM, Danpat Ray.
Ref. books	1. Herbert Taub and Donald Schilling. "Digital Integrated Electronics" . McGraw Hill. 1985. 2. S.K. Bose. "Digital Systems". 2/e. New Age International.1992. 3. D.K. Anvekar and B.S. Sonade. "Electronic Data Converters: Fundamentals &Applications". TMH.1994. 4. Malvino and Leach. "Digital Principles and Applications". TMG HillEdition 5. Microprocessor and Digital Systems – Douglas V.Hall

Web Resources	1. https://youtu.be/-paFaxtTCkI 2. https://youtu.be/s1DSZEaCX_g
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COURSE OUTCOMES:

At the end of the course, the student will be able to:

CO1	Learn about number systems, Boolean algebra, logical operation and logic gates
CO2	Understand the working of adder, subtractors, multiplexers and demultiplexers.
CO3	Get knowledge on flip-flops, registers and counters.
CO4	Gain inputs on architecture of microprocessor 8085.
CO5	Develop program writing skills .on microprocessor 8085.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Course Outcomes (COs)↓	Programme Outcomes (PO)					Programme Specific Outcomes(PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	3	2	3	2	3	3	2	3	2	2.6
CO-2	3	3	3	2	2	3	3	3	3	2	2.7
CO-3	3	3	3	2	2	3	3	3	3	2	2.7
CO-4	3	3	3	2	2	3	3	2	3	2	2.6
CO-5	3	3	2	2	2	3	3	3	2	2	2.5
Mean Overall Score											2.62 (High)

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

Question Paper Pattern

Maximum Marks: 70 Marks

Exam Duration: 3 Hrs

Part-A 10×2=20 Marks Answer ALL Questions (Two questions from each unit)

Part-B 5×4=20 Marks Answer ALL Questions (Either or Type-Two questions from each unit)

Part-C 3×10=30 Marks Answer Any Three Questions (Three out of Five-one question from each unit)

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	CC15	Semester – VI	Course Code: B5PH15P
Course Title	PHYSICS PRACTICAL – VI		
Credits – 4	Instruction Hours - 6		Medium: English and Tamil
Course Objectives	To perform basic experiments on characteristics of electronic devices and then get into the applications such as amplifiers, oscillators, counters, multivibrators. Perform fundamental experiments on microprocessor 8085 and learn to write C programs by themselves.		

Minimum of **Twelve Experiments** from the list:

1. Youngs Modulus Koenig's method – Uniform Bending.
2. Potentiometer – Specific Resistance of a Coil.
3. Potentiometer – Temperature coefficient of Thermistor.
4. Post office box – Temperature coefficient of resistance of a coil.
5. B.G. – Comparison of mutual inductances.
6. Spectrometer – (i- i') curve
7. Spectrometer – Cauchy's Constants A&B
8. Diffraction a straight edge.
9. RC coupled CE transistor amplifier - single stage.
10. Colpitt's oscillator -transistor.
11. Bistable multivibrator - Transistor.
12. FET - amplifier (common source)
13. Half subtractor and full subtractor using basic logic gate ICs
14. NOR as universal gate- verification.
15. Construction of Bridge Rectifiers.
16. Microprocessor 8085 – square (8 bit only)
17. Microprocessor 8085 – square root (8 bit only)
18. Microprocessor – Smallest and largest number in an array of data
19. C- Programming – Biggest and Smallest number from the given array.
20. C - Programming – Ascending and descending order of an array.

OUTCOMES

By the end of the course, the student will be able to

1. Verify the theoretical concepts in physics through experiments.
2. Understand the behavior of thermal properties of materials.
3. Understand the validity of basic laws and theories to determine various properties of materials.
4. Understand the application of various experiments in our day to day life.
5. Apply the knowledge of the fundamentals of physics and instrumentation to arrive at a solution for various problems.
6. Acquire programming skills in C language.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Course Outcomes (COs)↓	Programme Outcomes (PO)					Programme Specific Outcomes(PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	3	2	2	2	3	2	2	1	2	2.2
CO-2	3	3	3	2	2	3	2	2	1	1	2.2
CO-3	3	3	2	2	2	3	3	2	1	1	2.2
CO-4	3	3	3	2	2	3	3	2	1	1	2.3
CO-5	3	3	2	2	2	3	3	2	1	2	2.3
Mean Overall Score											2.24 (High)

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

HOD

COE

ELECTIVE COURSES
STUDENTS CAN CHOOSE ANY OF THESE SUBJECTS IN SEM. V AND VI
(For the candidates admitted 2026 – 2027 onwards)

Course	EC	Semester – V/VI	COURSE CODE: BPHECA
Course Title	COMMUNICATION PHYSICS		
Credits – 4	Instruction Hours – 4/5		Medium: English and Tamil
Learning Objective	To get a thorough knowledge on transmission and reception of radio waves, the different types of communication like fibre optic, radar, satellite, cellular		

UNITS	COURSE DETAILS
Unit - I	RADIO TRANSMISSION AND RECEPTION: Transmitter – modulation types of modulation – amplitude modulation – limitations of amplitude modulation – frequency modulation – comparison of FM and AM – demodulation- essentials in demodulation – receivers: AM radio receivers – types of AM radio receivers – stages of superheterodyne radio receiver, advantages – FM receiver – difference between FM and AM receivers.
Unit - II	FIBER OPTIC COMMUNICATION: Introduction – basic principle of fiber optics – advantages – construction of optical fiber – classification based on the refractive index profile – classification based on the number of modes of propagation – losses in optical fibers – attenuation–advantages of fiberoptic communication
Unit - III	RADAR COMMUNICATION: Introduction - basic radar system –radar range – antenna scanning –pulsed radar system – search radar –tracking radar – moving target indicator Doppler effect-MTI principle – CW Doppler radar
Unit - IV	SATELLITE COMMUNICATION: Introduction history of satellites – satellite communication system – satellite orbits – basic components of satellite communication system – commonly used frequency in satellite – communication –multiple access communication – satellite communication in India
Unit - V	MOBILE COMMUNICATION: Introduction – concept of cell –basic cellular mobile radio system – cellphone – facsimile – important features of fax machine – application of facsimile – VSAT (very small aperture terminals) modem IPTV (internet protocol television) -Wi-Fi-4G (basic ideas)
Text Books	1. V.K.Metha, Principles of Electronics, S. Chand &CoLtd., 2013 2. Anokh Singh and Chopra A.K., Principles of communication Engineering, S.Chand& Co, 2013
Ref. books	1. J.S. Chitode, Digital Communications, 2020, Unicorn publications 2. Senior John. M, Optical Fiber Communications: Principles and Practice, 2009, Pearson Education.

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

Question Paper Pattern

Maximum Marks: 70 Marks

Exam Duration: 3 Hrs

Part-A 10×2=20 Marks Answer ALL Questions (Two questions from each unit)

Part-B 5×4=20 Marks Answer ALL Questions (Either or Type-Two questions from each unit)

Part-C 3×10=30 Marks Answer Any Three Questions (Three out of Five-one question from each unit)

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	EC	Semester – V/VI	Course Code: BPHECB
Course Title	ENERGY PHYSICS		
Credits – 4	Instruction Hours – 4/5		Medium: English and Tamil
Learning Objective	To get the understanding of the conventional and non-conventional energy sources, their conservation and storage systems.		

UNITS	COURSE DETAILS
Unit - I	INTRODUCTION TO ENERGY SOURCES: Energy consumption as a measure of prosperity – world energy future – energy sources and their availability – conventional energy sources – non-conventional and renewable energy sources – comparison – merits and demerits.
Unit - II	SOLAR ENERGY: Solar energy Introduction – solar constant – solar radiation at the Earth's surface – solar radiation geometry – Solar radiation measurements – solar radiation data –solar energy storage and storage systems – solar pond – solar cooker – solar water heater – solar greenhouse – types of greenhouses – solar cells.
Unit - III	WIND ENERGY: Introduction –nature of the wind – basic principle of wind energy conversion – wind energy data and energy estimation – basic components of Wind Energy Conversion Systems (WECS) – advantages and disadvantages of WECS – applications – tidal energy
Unit - IV	BIOMASS ENERGY: Introduction – classification – biomass conversion technologies –photosynthesis – fermentation - biogas generation –classification of biogas plants – anaerobic digestion for biogas – wood gasification – advantages & disadvantages.
Unit - V	ENERGY STORAGE: Importance of energy storage- batteries - lead acid battery -nickel-cadmium battery – fuel cells – types of fuel cells – advantages and disadvantages of fuel cells – applications of fuel cells - hydrogen storage.
Text Books	1. G.D.Rai, Non-Conventional Sources of Energy, Khanna Publishers, 2009. 2. S P Sukhstme, J K Nayak, Solar Energy, Principles of Thermal Collection and Storage, McGraw Hill, 2008, 3 rd Edn. 3. D P Kothari, K P Singal, RakeshRajan, PHI Learning Pvt Ltd, 2011, 2 nd Edn.
Ref. books	1. John Twidell& Tony Weir, Renewable Energy Resources, Taylor & Francis, 2005, 2 nd Edn. 2. M. P. Agarwal, Solar Energy, S. Chand & Co. Ltd., New Delhi,1982 3. H. C. Jain, Non-Conventional Sources of Energy, Sterling Publishers,1986.

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

Question Paper Pattern

Maximum Marks: 70 Marks

Exam Duration: 3 Hrs

Part-A 10×2=20 Marks Answer ALL Questions (Two questions from each unit)

Part-B 5×4=20 Marks Answer ALL Questions (Either or Type-Two questions from each unit)

Part-C 3×10=30 Marks Answer Any Three Questions (Three out of Five-one question from each unit)

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	EC	Semester – V/VI	Course Code: BPHECC
Course Title	MATHEMATICAL PHYSICS		
Credits – 4	Instruction Hours – 4/5		Medium: English and Tamil
Learning Objective	To understand higher mathematical concepts which are applied to solve problems in Physics and similar situations		

UNITS	COURSE DETAILS
Unit - I	MATRICES: Types of matrices – symmetric, Hermitian, unitary and orthogonal matrices– characteristic equation of a matrix – Eigen values and Eigen vectors of a matrix – Cayley-Hamilton theorem – inverse of matrix by Cayley-Hamilton theorem – similarity transformations – diagonalization of 2x2 real symmetric matrices.
Unit - II	VECTOR CALCULUS: Vector differentiation – directional derivatives – definitions & Physical significance of gradient, divergence, curl – Laplace operators– vector identities – line, surface and volume integrals – statement, proof and simple problems for Gauss’s divergence theorem, Stoke’s theorem.
Unit - III	ORTHOGONAL CURVILINEAR COORDINATES: Tangent basis vectors – scale factors – unit vectors in cylindrical and spherical coordinate systems –gradient of a scalar –divergence and curl of a vector – Laplacian in these coordinate systems.
Unit - IV	FOURIER SERIES: Periodic functions – Dirichlet’s conditions – general Fourier series – even and odd functions and their Fourier expansions – Fourier cosine and sine – half range series – change of length of interval. Fourier analysis of square wave, saw-tooth wave, half wave/full wave rectifier wave forms. FOURIER TRANSFORMS: Fourier Integral theorem(Statement only)–Fourier, Fourier sine and Fourier cosine transforms,– Fourier transform of single pulse – trigonometric, exponential and Gaussian functions – inverse Fourier transform – convolution theorem.
Unit - V	APPLICATIONS OF PARTIAL DIFFERENTIAL EQUATIONS (PDE): PDE for transverse vibrations in elastic strings (one dimensional wave equation) –one dimensional heat flow equation – solutions to these PDE’s by method of separation of variables – problems based on boundary conditions and initial conditions.
Text Books	1. Advanced Engineering Mathematics, Erwin Kreyszig, 2008, Wiley India. 2. Mathematical Physics – P. K. Chattopadhyay, New Age International Publishers. 3. Mathematical Physics – B. D. Gupta. 4. Mathematical Physics – H. K. Das, S. Chand & Co, New Delhi.
Ref. books	1. Fourier Analysis by M.R. Spiegel, 2004, Tata McGraw-Hill. 2. Engineering Mathematics III- B, M. K. Venkataraman, 3. Vector space & Matrices – J. C. Jain, Narosa Publishing House Pvt. Ltd.

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

Question Paper Pattern

Maximum Marks: 70 Marks

Exam Duration: 3 Hrs

Part-A 10×2=20 Marks Answer ALL Questions (Two questions from each unit)

Part-B 5×4=20 Marks Answer ALL Questions (Either or Type-Two questions from each unit)

Part-C 3×10=30 Marks Answer Any Three Questions (Three out of Five-one question from each unit)

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	EC	Semester – V/VI	Course Code: BPHECD
Course Title	ADVANCED MATHEMATICAL PHYSICS		
Credits – 4	Instruction Hours – 4/5		Medium: English and Tamil
Learning Objective	The fundamentals of matrices and vector calculus learnt in earlier course will enable students to learn advanced topics and theorems. The special functions and applications of partial differential equations will be of use in research.		

UNITS	COURSE DETAILS
Unit - I	MATRICES: Introduction – special types of matrices – transpose – conjugate–conjugate transpose– symmetric & anti symmetric – Hermitian and skew Hermitian – orthogonal and unitary – characteristic equation – roots and characteristic vectors – diagonalization– Cayley–Hamilton theorem –simple problems
Unit - II	VECTOR CALCULUS: Voperator – divergence – second derivative of vector functions or fields –Laplacian operator – curl of a vector – line integral – line Integral of a vector field around an infinitesimal rectangle – curl of conservative field – surface integral – volume integral (without problem) – Gauss’s divergence theorem and proof – Stroke’s theorem and proof –simple problems.
Unit - III	SPECIAL FUNCTIONS: Definition –Beta function – Gamma function – evaluation of Beta function – other forms of Beta function – evaluation of Gamma function – other forms of Gamma function – relation between Beta and Gamma functions – simple problems.
Unit - IV	FROBENIUS METHOD AND SPECIAL FUNCTIONS: Singular points of second order linear differential equations and importance –singularities of Bessels and Laguerre equations, Frobenius method and applications to differential equations: Legendre and Hermite differential equations – Legendre and Hermite polynomials – Rodrigues formula –generating function – orthogonality
Unit - V	PARTIAL DIFFERENTIAL EQUATIONS: Solutions to partial differential equations using separation of variables - Laplace’s equation in problems of rectangular – cylindrical and spherical symmetry – conducting and dielectric sphere in an external uniform electric field – wave equation and its solution for vibrational modes of a stretched string
Text Books	1. Mathematical Physics, B.D. Gupta-Vikas Publishing House, 4 th Edition (2006) 2. Mathematical Physics, SatyaPrakash (Sultan Chand)
Ref. books	1. Mathematical Methods for Physicists, G.B.Arken, H.J.Weber, F.E.Harris (2013, 7th Edn., Elsevier) 2. Mathematical Physics–H. K. Dass, Dr. Rama Verma (S. Chand Publishing) 3. Advanced Engineering Mathematics, Erwin Kreyszig (Wiley India)

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

Question Paper Pattern

Maximum Marks: 70 Marks

Exam Duration: 3 Hrs

Part-A 10×2=20 Marks Answer ALL Questions (Two questions from each unit)

Part-B 5×4=20 Marks Answer ALL Questions (Either or Type-Two questions from each unit)

Part-C 3×10=30 Marks Answer Any Three Questions (Three out of Five-one question from each unit)

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	EC	Semester – V/VI	Course Code: BPHECE
Course Title	C PROGRAMMING		
Credits – 4	Instruction Hours – 4/5		Medium: English and Tamil
Learning Objective	• To understand the fundamentals of the C programming language, including data types, variables, operators, expressions, and input/output statements. • To develop logical problem-solving skills using algorithms, flowcharts, decision-making, loops, arrays, and program development techniques. • To design, write, compile, and debug simple C programs for solving basic computational problems using structured programming concepts.		

UNITS	COURSE DETAILS
Unit - I	INTRODUCTION TO C: History of C – C character set – Key words – identifier – Constants – type of constants – variables – Tokens – Data types and storage – Data type qualifiers.
Unit - II	DECLARATION OF VARIABLES: Declaration of variables – Assigning values to variables – Declaring variables as constants – Declaring variables as volatile – overflow and underflow of data.
Unit - III	C-OPERATORS: Arithmetic, Logical, Assignment, Relational, Increment and Decrement, Conditional, Bitwise, Special operator precedence and Associativity- C expressions – Arithmetic expressions – Evaluation of expressions – Type cast operator – I/O statements.
Unit - IV	DECISION MAKING AND ARRAYS: Simple if statement – if-else – else if ladder – nested if-else- switch statement – go statement – While – do- while statements, for loop, break and continue statement – Declaration and initialization of one dimensional arrays.
Unit - V	ALGORITHM, FLOW CHART AND PROGRAM: Program development cycle – Algorithm – flow chart – C-Programs: Average of set of numbers – greatest, smallest – conversion of Fahrenheit to Celsius and Celsius to Kelvin– sorting set of numbers in ascending and descending order.
Text Books	1. Programming in C, Balagurusamy, TMG, ND, 2012 2. C Programming by I.Edwin Dayanand and R.K. Selvakumar, NV Publications, Pollachi.
Ref. books	1. Schaum's outline series, Theory and Problems of programming in C, C.Byron& S. Gottfried, Tata McGraw Hill 2003

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
25	75	100	

Question Paper Pattern

Maximum Marks: 70 Marks

Exam Duration: 3 Hrs

Part-A 10×2=20 Marks Answer ALL Questions (Two questions from each unit)

Part-B 5×4=20 Marks Answer ALL Questions (Either or Type-Two questions from each unit)

Part-C 3×10=30 Marks Answer Any Three Questions (Three out of Five-one question from each unit)

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	EC	Semester – V/VI	Course Code: BPHECF
Course Title	MATERIALS SCIENCE		
Credits – 4	Instruction Hours – 4/5		Medium: English and Tamil
Learning Objective	To learn imperfections in crystals, deformation of materials and testing of materials. To get knowledge on behavior of a material, under the action of light and their applications. To know the applications of crystal defects.		

UNITS	COURSE DETAILS
Unit - I	CRYSTAL IMPERFECTIONS: Introduction – point defects: vacancies, interstitials, impurities, electronic defects –line defects: edge dislocation, screw dislocation – surface defects: extrinsic defects – intrinsic defects: grain boundaries, tilt & twist boundaries, twin boundaries, stacking faults – volume defects – effect of imperfections.
Unit - II	MATERIAL DEFORMATION: Introduction – elastic behavior of materials – modulus as a parameter in design – rubber like elasticity – inelastic behavior of materials – relaxation process – viscoelastic behavior of materials – spring-Dash pot models of viscoelastic behavior of materials.
Unit - III	PERMANENT DEFORMATION AND STRENGTHENING METHODS OF MATERIALS: Introduction – plastic deformation: tensile stress-strain curve – plastic deformation by slip – creep: mechanism of creep – creep resistant materials – strengthening methods: strain hardening, grain refinement – solid solution strengthening – precipitation strengthening.
Unit - IV	OPTICAL MATERIALS: Introduction – optical absorption in metals, semiconductors and insulators – NLO materials and their applications – display devices and display materials: fluorescence and phosphorescence – light emitting diodes – liquid crystal displays.
Unit - V	MECHANICAL TESTING: Destructive testing: tensile test, compression test, hardness test – nondestructive testing (NDT):– thermal methods of NDT: thermography – equipment used for NDT: metallurgical microscope
Text Books	1. Material science and Engineering, Raghavan V, Prentice Hall of India, Sixth Edition, 2015 2. Materials science, V. Rajendran, McGraw Hill publications 2011
Ref. books	1. William D. Callister, Jr., Material Science & Engineering – An Introduction, 8th Edition, John Wiley & Sons, Inc., 2007 2. W. Bolton, “Engineering materials technology”, 3rd Edition, Butterworth & Heinemann, 2001.

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

Question Paper Pattern

Maximum Marks: 70 Marks

Exam Duration: 3 Hrs

Part-A 10×2=20 Marks Answer ALL Questions (Two questions from each unit)

Part-B 5×4=20 Marks Answer ALL Questions (Either or Type-Two questions from each unit)

Part-C 3×10=30 Marks Answer Any Three Questions (Three out of Five-one question from each unit)

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	EC	Semester – V/VI	Course Code: BPHECG
Course Title	LASERS AND FIBER OPTICS		
Credits – 4	Instruction Hours – 4/5		Medium: English and Tamil
Learning Objective	The students will learn the fundamentals, types of lasers, laser instrumentation and their applications also the interconnect between optics with lasers.		

UNITS	COURSE DETAILS
Unit - I	FUNDAMENTALS OF LASER: Basic principles: spontaneous and stimulated emission – Einstein’s coefficient – pumping mechanism: optical, electrical and laser pumping – population inversion – two and three level laser system
Unit - II	TYPES OF LASER: Solid state laser: ruby laser, Nd: YAG laser, semiconductor laser: Homo junction semiconductor laser, chemical laser: neutral atom gas laser (He-Ne laser), CO ₂ laser.
Unit - III	APPLICATIONS OF LASER: Application of laser in metrology – optical communication – material processing: laser instrumentation of material processing, powder feeder, laser heating, laser welding, laser melting – medical application – Laser instrumentation for surgeries–laser in astronomy
Unit - IV	FIBER OPTICS: Basic components of optical fiber communication – principles of light propagation through fiber – total internal reflection – optical fiber – coherent bundle – numerical aperture– types of fiber: single mode and multi-mode fiber – step index and graded index fiber – fiber optic sensors – application of fiber optics.
Unit - V	CHARACTERISTICS AND FABRICATION OF OPTICAL FIBER: Fiber characteristics: mechanical and transmission characteristics – absorption loss and scattering loss measurements – dispersion – connectors and splicers – fiber material – fiber fabrication – fiber optic cables design.
Text Books	1. B.B. Laud - Laser and Non-linear Optics, New Age International Publications Third Edition, NewDelhi. 2. An Introduction to laser, theory and applications by Avadhunulu, M.N.S.,Chand &Co, NewDelhi 3. J.Wilson and J.F.B. Hawkes. ‘Introduction to Opto Electronics’, Pearson Education, 2018
Ref. books	1. A.Sennaroglu,“PhotonicsandLaserEngineering:Principles,DevicesandApplications”McGraw-HillEducation,2010. 2. K.R.Nambiar,“Lasers:Principles,TypesandApplications”,NewAgeInternational,2004.

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

Question Paper Pattern

Maximum Marks: 70 Marks

Exam Duration: 3 Hrs

Part-A 10×2=20 Marks Answer ALL Questions (Two questions from each unit)
Part-B 5×4=20 Marks Answer ALL Questions (Either or Type-Two questions from each unit)
Part-C 3×10=30 Marks Answer Any Three Questions (Three out of Five-one question from each unit)

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	EC	Semester – V/VI	Course Code: BPHECH
Course Title	DIGITAL PHOTOGRAPHY		
Credits – 4	Instruction Hours – 4 /5		Medium: English and Tamil
Learning Objective	To understand the principles of photography and image formation and the science and arts behind it. To understand the essential components of conventional and digital cameras and also the different image processing techniques.		

UNITS	COURSE DETAILS
Unit - I	PHOTOGRAPHY AND BASIC PRINCIPLE OF IMAGE FORMATION: Principle –chemical route and digital route –light, wavelengths, colours – shadows – light intensity and distance – making light form images –pin-hole images – practical limitations to pin-hole images – lens instead of pin-hole – focal length and image size – imaging of closer subjects.
Unit - II	LENSES – CONTROLLING THE IMAGES: Photographic lens – focal length and angle of view (<i>problems</i>) – focusing movement – aperture and f-numbers (<i>problems</i>) – depth of field– depth of focus – image stabilization – lenses for digital cameras – lens and camera care
Unit - III	CAMERA USING FILMS AND ITS TYPES: Camera and its essential components– shutter – aperture – light measurement – film housing – camera types: view camera– view finder camera – Reflex camera– single lens reflex (SLR) camera
Unit - IV	DIGITAL CAMERAS PRINCIPLE AND TYPES: Principle of digital image capturing –comparison of digital and analog picture information – megapixel – grain, noise and pixel density – optical and digital zooming – image stabilizer – bit depth – white balance – colour modes – file formats (TIFF, RAW & JPEG) – storage cards and types – digital cameras: camera phones – compact camera – hybrid camera – digital SLR.
Unit - V	THE DIGITAL IMAGE – POSTPRODUCTION: Hardware: computer and its peripherals – software: saving digital file – basic editing: navigating the image – undo/redo/history – crop – rotate – brightness &contrast – colour balance – hue/saturation – dodge/burn –removing an element in an image – advanced editing: histogram/levels – curves – selection tools: magic wand – printing digital images: inkjet printer – laser printer – dye sub printer – lambda/light jet printers.
Text Books	1. Michel J.Langford , Anna Fox & Richard Sawdon Smith, Basic photography, 9 th Edition, , 2010-NL, Focal press, London 2. Henry Carroll, Read this if you want to take great photographs of people, Laurence King Publishing
Ref. books	1. Mark Galer, Digital Photography in Available Light essential skills, 2006, Focal press, London 2. Paul Harcourt Davies, The Photographer’s practical handbook, 2005, UK PRESS

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

Question Paper Pattern

Maximum Marks: 70 Marks

Exam Duration: 3 Hrs

Part-A 10×2=20 Marks Answer ALL Questions (Two questions from each unit)

Part-B 5×4=20 Marks Answer ALL Questions (Either or Type-Two questions from each unit)

Part-C 3×10=30 Marks Answer Any Three Questions (Three out of Five-one question from each unit)

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	EC	Semester – V/VI	Course Code: BPHECI
Course Title	NANO SCIENCE AND NANO TECHNOLOGY		
Credits – 4	Instruction Hours – 4 /5		Medium: English and Tamil
Learning Objective	This course aims to provide an overall understanding of Nanoscience and Nanotechnology and introduces different types of nanomaterials, their properties, fabrication methods, characterization techniques and a range of applications.		

UNITS	COURSE DETAILS
Unit - I	NANOSCIENCE AND NANOTECHNOLOGY: Nanoscale– nature and nanostructures – nanostructures: 0D, 1D,2D– surface to volume ratio– size effect – excitons – quantum confinement– metal based nanoparticles (metal and metal oxide) – nanocomposites (non-polymer based) – carbon nanostructures – fullerene – SWCNT and MWCNT
Unit - II	PROPERTIES OF NANOMATERIALS: Introduction–mechanical behavior – elastic properties – hardness and strength – ductility and toughness –superplastic behavior – optical properties – surface plasmon resonance – electrical properties – dielectric materials and properties – magnetic properties – super paramagnetism – electrochemical properties – properties of CNTs.
Unit - III	FABRICATION METHODS AND VACUUM TECHNIQUES: Top-down and bottom-up approaches – electrochemical method – chemical & physical vapour depositions (CVD & PVD) – plasma arc discharge – sputtering – thermal evaporation – pulsed laser deposition – ball milling – lithography: photolithography – e-beam lithography – sol-gel methods – synthesis of CNT.
Unit - IV	CHARACTERIZATION TECHNIQUES: Scanning probe microscopy – scanning tunneling microscopy – atomic force microscopy – scanning electron microscopy – transmission electron microscopy –powder XRD method: determination of structure and grain size analysis – UV-visible and photoluminescence spectroscopy.
Unit - V	APPLICATIONS OF NANOMATERIALS: medicine: drug delivery – photodynamic therapy – molecular motors –energy: fuel cells –rechargeable batteries – supercapacitors– photovoltaics. sensors: nanosensors based on optical and physical properties – electrochemical sensors – nanobiosensors. nanoelectronics: CNTFET – display screens – GMR read/write heads – nanorobots –applications of CNTs
Text Books	1. K.K.Chattopadhyay and A.N.Banerjee, (2012), Introduction to Nanoscience and Nanotechnology, PHI Learning Pvt. Ltd., 2. M.A. Shah, Tokeer Ahmad (2010), <u>Principles of Nanoscience and Nanotechnology</u> , Narosa Publishing House Pvt Ltd. 3. Mick Wilson, et al (2005) <u>Nanotechnology</u> , Overseas Press.
Ref. books	1. Richard Booker and Earl Boysen, (2005) <u>Nanotechnology</u> , Wiley Publishing Inc. 2. J.H.Fendler (2007) Nano particles and nano structured films; Preparation, Characterization and Applications, John Wiley & Sons

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

Question Paper Pattern

Maximum Marks: 70 Marks

Exam Duration: 3 Hrs

Part-A 10×2=20 Marks Answer ALL Questions (Two questions from each unit)

Part-B 5×4=20 Marks Answer ALL Questions (Either or Type-Two questions from each unit)

Part-C 3×10=30 Marks Answer Any Three Questions (Three out of Five-one question from each unit)

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	EC	Semester – V/VI	Course Code: BPHECJ
Course Title	MEDICAL INSTRUMENTATION		
Credits – 4	Instruction Hours – 4 /5		Medium: English and Tamil
Learning Objective	This course aims to provide background of the Physics principles in medical instrumentation technologies through theoretical & practical learning.		

UNITS	COURSE DETAILS
Unit - I	BIOMETRICS: Introduction to man-instrument system and its components – problems encountered in measuring living systems – transducers– force, motion, pressure transducers. AUDIOMETRY: Mechanism of hearing – air and bone conduction – threshold of hearing –audiometer – masking in audiometry – pure tone and speech audiometer – evoked response audiometry – hearing aids
Unit - II	BIOELECTRIC POTENTIALS AND ELECTRODES: Biomedical signals – sources of bioelectric potentials – resting, action and propagation of bioelectric potentials –bio-potential electrodes – skin surface, needle electrodes. BIOMEDICAL RECORDERS: Electro-conduction system of heart – electro cardiogram (ECG) – Einthoven’s triangle — electro encephalogram (EEG) –brain waves – EEG instrumentation.
Unit - III	DIAGNOSTIC RADIOLOGY: Radiography – primary radiological image – contrast agents, filters– beam restrictor, grid –image quality RADIOISOTOPES AND NUCLEAR MEDICINE: Radioisotopes – radiopharmaceuticals – technetium generator – gamma camera – positron emission tomography – disposal of radioactive waste.
Unit - IV	ULTRASOUND IMAGING: Ultrasound transducer – ultrasound imaging– Doppler ultrasound – ultrasound image quality & bio-effects. MAGNETIC RESONANCE IMAGING: Proton& external magnetic field – precession – radiofrequency and resonance – MRI signal – relaxation time – MRI instrumentation – imaging sequences – biosafety
Unit - V	PROJECT ASSIGNMENT: Clinical practice of <i>one</i> of the following:electro cardiogram, electro encephalogram, electro myogram, electro oculogram, computed tomography, positron emission tomography, ultrasound
Text Books	1. Leslie Cromwell, Fred Weibell, Erich Pfeiffer(2002) Biomedical Instrumentation & Measurements Prentice Hall of India, New Delhi. 2. R. S. Khandpur (2003)Handbook of Biomedical Instrumentation 2 nd Edn. Tata McGraw Hill, New Delhi.
Ref. books	1. John Webster (2004) Bioinstrumentation John Wiley and Sons, Singapore. 2. John Enderle, Susan Blanchard, Joseph Bronzino (2005) Introduction to Biomedical Engineering, 2 nd ed. Elsevier, San Deigo

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

Question Paper Pattern

Maximum Marks: 70 Marks

Exam Duration: 3 Hrs

Part-A 10×2=20 Marks Answer ALL Questions (Two questions from each unit)

Part-B 5×4=20 Marks Answer ALL Questions (Either or Type-Two questions from each unit)

Part-C 3×10=30 Marks Answer Any Three Questions (Three out of Five-one question from each unit)

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	EC	Semester – III	Course Code: B3APH1
Course Title	ALLIED PHYSICS – I		
Credits – 4	Instruction Hours - 4		Medium: English and Tamil
Learning Objective	To impart basic principles of Physics that which would be helpful for students who have taken programmes other than Physics.		

UNITS	COURSE DETAILS
Unit - I	WAVES, OSCILLATIONS AND ULTRASONICS: Simple harmonic motion (SHM) – composition of two SHMs at right angles– Lissajous figures – uses – laws of transverse vibrations of strings – determination of AC frequency using sonometer – ultrasound – production – piezoelectric method – application of ultrasonics.
Unit - II	PROPERTIES OF MATTER: <i>Elasticity:</i> Elastic constants – bending of beam – theory of non- uniform bending – determination of Young’s modulus by non-uniform bending – torsion of a wire – determination of rigidity modulus by torsional pendulum <i>Viscosity:</i> Streamline and turbulent motion – critical velocity – coefficient of viscosity – Poiseuille’s formula.
Unit - III	HEAT AND THERMODYNAMICS: Joule-Kelvin effect – temperature of inversion Joule – Thomson porous plug experiment – Linde’s process of liquefaction of air – laws of thermodynamics – heat engine – Carnot’s cycle – efficiency – entropy – change of entropy in reversible and irreversible process.
Unit - IV	ELECTRICITY AND MAGNETISM: Potentiometer – principle – measurement of thermo emf using potentiometer – magnetic field due to a current carrying conductor – Biot-Savart’s law – field along the axis of the coil carrying current – peak, average and RMS values of ac current and voltage – power factor.
Unit - V	SEMICONDUCTOR PHYSICS Intrinsic semiconductor – Extrinsic semiconductor – P-N junction diode – biasing of P-N junction – characteristic of diode – Half wave rectifier - Full wave bridge rectifier – construction and working – zener diode – characteristic of zener diode – voltage regulator.
Unit - VI	PROFESSIONAL COMPONENTS: expert lectures –seminars — webinars – industry inputs – social accountability – patriotism.
Text Books	1. R.Murugesan (2001),AlliedPhysics,S. Chand&Co,NewDelhi. 2. BrijlalandN.Subramanyam (1994), WavesandOscillations,VikasPublishingHouse,NewDelhi. 3. R.Murugesan(2005), OpticsandSpectroscopy,S.Chand&Co,NewDelhi. 4. A.Subramaniyam, AppliedElectronics2 nd Edn.,NationalPublishingCo.,Chennai.
Ref. books	1. ResnickHallidayandWalker(2018).FundamentalsofPhysics(11 th edition),John Willeyand Sons, Asia Pvt.Ltd., Singapore. 2. V.R.KhannaandR.S.Bedi (1998), TextbookofSound1 st Edn. KedharnaathPublish&Co, Meerut.

Web Resources	1. https://youtu.be/M_5KYncYNyc 2. https://youtu.be/ljJLJgIvaHY 3. https://youtu.be/h5jOA57OXM 4. https://learningtechnologyofficial.com/category/fluid-mechanics-lab/
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COURSE OUTCOMES:

At the end of the course, the student will be able to:

CO1	Explain types of motion and extend their knowledge in the study of various dynamic motions analyze and demonstrate mathematically. Relate theory with practical applications in medical field.
CO2	Explain their knowledge of understanding about materials and their behaviors and apply it to various situations in laboratory and real life. Connect droplet theory with Corona transmission.
CO3	Comprehend basic concept of thermodynamics concept of entropy and associated theorems able to interpret the process of flow temperature physics in the back ground of growth of this technology.
CO4	Articulate the knowledge about electric current resistance, capacitance in terms of potential electric field and electric correlate the connection between electric field and magnetic field and analyze them.
CO5	Summarize the working of semiconductor devices like junction diode, Zener diode, transistors and practical devices we daily use like USB chargers and EV charging stations.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Course Outcomes (COs)↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	2	2	2	2	3	3	2	2	3	2.4
CO-2	2	3	2	1	2	3	3	2	2	3	2.3
CO-3	1	2	3	2	3	2	3	2	3	3	2.4
CO-4	2	2	2	3	2	2	3	2	2	3	2.3
CO-5	2	2	2	2	3	1	3	2	2	3	2.2
Mean Overall Score											2.32 (High)

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

Question Paper Pattern

Maximum Marks: 70 Marks

Exam Duration: 3 Hrs

Part-A 10×2=20 Marks Answer ALL Questions (Two questions from each unit)

Part-B 5×4=20 Marks Answer ALL Questions (Either or Type-Two questions from each unit)

Part-C 3×10=30 Marks Answer Any Three Questions (Three out of Five-one question from each unit)

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	EC	Semester –III & IV	Course Code: BAPH2P
Course Title	ALLIED PRACTICAL		
Credits – 4	Instruction Hours - 3		Medium: English and Tamil
Learning Objective	Apply various physics concepts to understand Properties of Matter and waves, set up experimentation to verify theories, quantify and analyse, able to do error analysis and correlate results		

Any **Fourteen** Experiments only

1. Young's modulus by non-uniform bending using pin and microscope
2. Young's modulus by non-uniform bending using optic lever, scale and telescope
3. Rigidity modulus by static torsion method.
4. Rigidity modulus by torsional oscillations without mass
6. Surface tension and interfacial Surface tension – drop weight method
7. Coefficient of viscosity of a given liquid–burette method
8. Specific heat capacity of a liquid by Newtons Law of cooling
9. Verification of laws of transverse vibrations using sonometer
10. Calibration of low range voltmeter using potentiometer
11. Determination of specific resistance using meter bridge.
12. Verification of truth tables of basic logic gates using ICs
13. Verification of De Morgan's theorems using logic gate ICs.
14. Use of NAND as universal building block.
15. Radius of curvature of lens by forming Newton's rings
16. Thickness of a wire using air wedge
17. Refractive index of solid prism
18. Refractive index of the liquid using liquid prism
19. Wavelength of mercury lines using spectrometer and grating
20. Determination of AC frequency using sonometer
21. Specific resistance of a wire using PO box
22. Determination of specific resistance using Carey Foster Bridge.
23. Thermal conductivity of poor conductor using Lee's disc
24. Determination of Earth's magnetic field using field along the axis of a coil
25. Characterisation of Junction diode
26. Characterisation of Zener diode
27. Construction of AND, OR, NOT gates using diodes and transistor
28. NOR gate as a universal building block

Note : Use of digital balance permitted

OUTCOMES

By the end of the course, the student will be able to

1. Verify the theoretical concepts in physics through experiments.
2. Understand the behavior of thermal properties of materials.
3. Understand the of basic laws and theories to determine various properties of materials.
4. Understand the application of various experiments in our day to day life.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Course Outcomes (COs)↓	Programme Outcomes (PO)					Programme Specific Outcomes(PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	3	2	2	2	3	2	2	1	2	2.2
CO-2	3	3	3	2	2	3	2	2	1	1	2.2
CO-3	3	3	2	2	2	3	3	2	1	1	2.2
CO-4	3	3	3	2	2	3	3	2	1	1	2.3
CO-5	3	3	2	2	2	3	3	2	1	2	2.3
MeanOverallScore											2.24 (High)

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	EC	Semester – IV	Course Code: B4APH3
Course Title	ALLIED PHYSICS –II		
Credits – 4	Instruction Hours - 3		Medium: English and Tamil
Learning Objective	To understand the basic concepts of optics, modern Physics, concepts of relativity and quantum physics, semiconductor physics, and electronics.		

UNITS	COURSE DETAILS
Unit - I	OPTICS Interference – interference in thin films – colors of thin films – air wedge – determination of diameter of a thin wire by air wedge – normal incidence – experimental determination of wavelength using diffraction grating – polarization – polarization by double reflection – Brewster’s law – optical activity – application in sugar industries
Unit - II	ELECTROSTATICS Coulomb’s law – Gauss theorem – Applications – Mechanical force on the surface of charged conductor – Capacitors – Principle of a capacitor - Capacity of spherical capacitor – Cylindrical capacitor – Energy of a charged capacitor - Loss of energy due to sharing of charges.
Unit - III	ATOMIC PHYSICS Atom models – Bohr atom model – mass number – atomic number – nucleons – vector atom model – various quantum numbers – Pauli’s exclusion principle – Stark effect – Zeeman effect (elementary ideas only) – photo electric effect – Einstein’s photoelectric equation – applications of photoelectric effect.
Unit - IV	NUCLEAR PHYSICS Nuclear models – liquid drop model – shell model – magic numbers – mass defect – binding energy – controlled and uncontrolled chain reaction – nuclear fission – chain reaction – energy released in fission – atom bomb – nuclear reactor – nuclear fusion – differences between fission and fusion – thermonuclear reactions.
Unit - V	DIGITAL ELECTRONICS AND DIGITAL INDIA: logic gates, OR, AND, NOT, NAND, NOR , EXOR logic gates – universal building blocks – Boolean algebra – De Morgan’s theorem – verification – overview of Government initiatives: software technological parks under MeitY– an introduction to Digital India.
Text Books	1. R.Murugesan (2005), Allied Physics, S.Chand&Co,NewDelhi. 2. K.Thangarajand D.Jayaraman (2004), Allied Physics, Popular Book Depot, Chennai. 3. Brijlal and N.Subramanyam (2002), Text book of Optics, S.Chand & Co,NewDelhi. 4. R.Murugesan (2005), Modern Physics, S.Chand&Co,NewDelhi.
Ref. books	1. Resnick Halliday andWalker (2018), Fundamentals of Physics, 11 th Edn., JohnWileyandSons, Asia Pvt.Ltd.,Singapore. 2. D.R.Khanna and H.R. Gulati (1979).Optics, S.Chand & Co.Ltd.,New Delhi. 3. Thomas L. Floyd (2017), Digital Fundamentals, 11 th Edn., Universal Book Stall, NewDelhi.

Web Resources	1. https://www.berkshire.com/learning-center/delta-p-facemask/https://www.youtube.com/watch?v=QrhxU47gtj4https://www.youtube.com/watch?time_continue=318&v=D38BjgUdL5U&feature=emb_logo 2. https://www.validyne.com/blog/leak-test-using-pressure-transducers/ 3. https://www.metoffice.gov.uk/weather/learn-about/weather/optical-effects
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COURSE OUTCOMES:

At the end of the course, the student will be able to:

CO1	Explain the concepts of interference diffraction using principles of superposition of waves and rephrase the concept of polarization based on wave patterns
CO2	Outline the basic foundation of different atom models and various experiments establishing quantum concepts. Relate the importance of interpreting improving theoretical models based on observation. Appreciate interdisciplinary nature of science and in solar energy related applications.
CO3	Summarize the properties of nuclei, nuclear forces structure of atomic nucleus and nuclear models. Solve problems on decay rate half-life and mean-life. Interpret nuclear processes like fission and fusion.
CO4	To describe the basic concepts of relativity like equivalence principle, inertial frames and Lorentz transformation. Extend their knowledge on concepts of relativity and vice versa.
CO5	Interpret the real life solutions using AND, OR, NOT basic logic gates and intend their ideas to universal building blocks. Infer operations using Boolean algebra and acquire elementary ideas of IC circuits. Acquire information about various Govt. programs/ institutions in this field.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Course Outcomes (COs)↓	Programme Outcomes (PO)					Programme Specific Outcomes(PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	2	3	2	2	2	2	3	1	3	2	2.2
CO-2	2	3	2	3	2	2	2	3	2	3	2.4
CO-3	2	3	2	2	2	2	2	3	3	1	2.2
CO-4	2	3	1	3	3	2	3	1	3	3	2.4
CO-5	2	3	1	2	1	2	3	3	3	2	2.2
Mean Overall Score											2.28 (High)

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

Question Paper Pattern

Maximum Marks: 70 Marks

Exam Duration: 3 Hrs

Part-A 10×2=20 Marks Answer ALL Questions (Two questions from each unit)

Part-B 5×4=20 Marks Answer ALL Questions (Either or Type-Two questions from each unit)

Part-C 3×10=30 Marks Answer Any Three Questions (Three out of Five-one question from each unit)

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	EC	Semester – III	Course Code: B3APHCS1
Course Title	APPLIED PHYSICS –I		
Credits – 4	Instruction Hours - 3		Medium: English
Learning Objective	To understand electrostatics, magneto statics and electro dynamics. To study the various laws and its application in current electricity. To acquire knowledge about electromagnetic induction and alternating current.		

UNITS	COURSE DETAILS
Unit - I	ELECTROSTATICS: Coulomb's law – Gauss theorem - Application -Mechanical force on the surface of a charged conductor- Potential energy stored per unit volume in an electric field - Capacitors-Principles of a capacitor -Capacity of spherical capacitor–cylindrical - Energy of a charged capacitor - Loss of energy due to sharing of charges.
Unit - II	MAGNETOSTATICS: Magnetic field- magnetic flux density – magnetization – Intensity of magnetization-Permeability – Susceptibility – relation between them – magnetic potential – potential due to a dipole – relation between potential and intensity – magnetic shell and its potential at any point – Properties of dia, Para and ferromagnetic materials.
Unit - III	CURRENT ELECTRICITY: Ohm's law – Laws of resistance in series and parallel - Kirchhoff's law- Wheatstone bridge –Meter bridge - Carrey Foster's bridge – Determination of specific resistance– Potentiometer – Measurement of current and resistance– Calibration of low range voltmeter.
Unit - IV	ELECTROMAGNETIC INDUCTION: Laws of electromagnetic induction-Relation between induced emf and mutual induction – self-induction by Rayleigh' method – mutual induction– absolute determination of M – Co-efficient of coupling – Transformer principle, construction and working.
Unit - V	ALTERNATING CURRENT: A/C circuits with single components- Circuit with RL, RC, and LC -measurement of current and voltages – power in an AC circuit – Power factor- LCR – Series and Parallel resonant circuits – Choke coil.
Text Books	1. Applied physics – Paper I –A.Sundaravelusamy – Priya publications Karur 2012. 2. Electricity and Magnetism – Brijlal and Subramanian, RatanPrakashan Mandir, New Delhi, 2000. 3. Electricity and Magnetism – Narayanamurthy&Nagarathinam..
Ref. books	1. Electricity and Magnetism –D.L. Seghal, K.L.Chopraand N.K. Sehgal. 5 th Edition S. Chand&Sons. New Delhi,1996.

COURSE OUTCOMES:

At the end of the course, the student will be able to:

CO1	Explain the concept of Coulomb's law – Gauss theorem and Loss of energy due to sharing of charges
CO2	Outline the basic foundation of Magnetic field- magnetic flux density and about the types of magnets and Properties of dia, Para and ferromagnetic materials
CO3	Summarize about the Ohm's law and laws of resistance in series and parallel also Kirchhoff's law and about Wheatstone bridge
CO4	To describe the basic concept of Laws of electromagnetic induction and the transformer principle, construction and working
CO5	Summarize the working of A/C circuits with single components and Choke coil.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Course Outcomes (COs)↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	2	2	2	2	3	3	2	2	3	2.4
CO-2	2	3	2	1	2	3	3	2	2	3	2.3
CO-3	1	2	3	2	3	2	3	2	3	3	2.4
CO-4	2	2	2	3	2	2	3	2	2	3	2.3
CO-5	2	2	2	2	3	1	3	2	2	3	2.2
Mean Overall Score											2.32 (High)

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

Question Paper Pattern

Maximum Marks: 70 Marks

Exam Duration: 3 Hrs

Part-A 10×2=20 Marks Answer ALL Questions (Two questions from each unit)

Part-B 5×4=20 Marks Answer ALL Questions (Either or Type-Two questions from each unit)

Part-C 3×10=30 Marks Answer Any Three Questions (Three out of Five-one question from each unit)

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	EC	Semester – III & IV	Course Code: B4APHCS2P
Course Title	APPLIED PHYSICS PRACTICAL		
Credits – 4	Instruction Hours - 3		Medium: English
Learning Objective	Apply various physics concepts to understand Properties of Matter and waves, set up experimentation to verify theories, quantify and analyse, able to do error analysis and correlate results		

Any Fourteen only

1. Carey Foster's Bridge – Resistance and specific resistance.
2. Potentiometer – Resistance and specific resistance.
3. Potentiometer – calibration of ammeter.
4. Potentiometer – Calibration of low range voltmeter
5. Potentiometer – Calibration of high range voltmeter.
6. Field along the axis of the coil-determination of magnetic flux using deflection Magnetometer.
7. Moment of a magnet using a coil carrying current.
8. LCR - Series resonant circuit – Self inductance and quality factor of a coil.
9. LCR – Parallel resonant circuit – Self inductance and quality factor of a coil.
10. Characteristic of a Junction diode.
11. Characteristics of Zener diode.
12. Static characteristic of transistor – common base configuration.
13. Characteristics of FET.
14. Half wave rectifier.
15. Zener controlled voltage regulator.
16. AND, OR, NOT, gates using discrete components
17. Basic logic gates using IC's.
18. Operational Amplifier – Adder, Subtractor.

OUTCOMES

By the end of the course, the student will be able to

1. Verify the theoretical concepts in physics through experiments.
2. Understand the behavior of thermal properties of materials.
3. Understand the validity of basic laws and theories to determine various properties of materials.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Course Outcomes (COs)↓	Programme Outcomes (PO)					Programme Specific Outcomes(PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	2	3	2	1	3	3	1	2	3	2.3
CO-2	3	3	2	1	2	3	3	2	2	2	2.3
CO-3	3	2	3	1	2	2	3	2	3	2	2.3
CO-4	3	2	3	1	2	3	2	1	2	3	2.2
CO-5	3	3	3	2	2	2	3	1	2	3	2.4
MeanOverallScore											2.3 (High)

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	EC	Semester – IV	Course Code: B4APHCS3
Course Title	APPLIED PHYSICS –II		
Credits – 4	Instruction Hours - 3		Medium: English
Learning Objective	To understand basics of Electronics, Laser and Optoelectronics.		

UNITS	COURSE DETAILS
Unit - I	SEMICONDUCTOR PHYSICS: Theory of energy bands in crystals -Distinguish between Conductors - Insulators and semiconductors - Hall Effect in semiconductors -Junction diode –Half wave rectifier – Zener diode - Zener diode as voltage regulators.
Unit - II	TRANSISTORS: PNP and NPN Transistors-Transistor Action- characteristics of transistor in CB and CE configuration - Transistors as an amplifier, Oscillator- FET - N channel and P channel FET -performance –Characteristics- FET Amplifier.
Unit - III	MASER AND LASER: Basic concepts of spontaneous and stimulated emission – Optical pumping - population inversion - Meta stable state -Maser – Ammonia maser. Lasers- Ruby laser and He - Ne laser – Applications of laser
Unit - IV	OPTO ELECTRONIC DEVICES: Photo electric effect - Laws of Photo electric effect - Photo electric cell - Photo voltaic cell - Applications - Light emitting diode - photo transistors - Electronic Watches - Seven segment display - LCD.
Unit - V	OPERATIONAL AMPLIFIERS AND INTEGRATED CIRCUITS: The Basic Operational amplifier - Inverting and Non inverting Operational amplifier - Differential Operational amplifier - CMRR- Basic uses of Operational amplifier - Adder - Subtractor -Differentiator –Integrator – Comparator. Integrated circuit – Classification – Fabrication of basic monolithic IC.
Text Books	1.Applied Physics - Paper II- A.Sundaravelusamy -Priya Publications Karur 2012 2.Basic Electronics (solid state) - B.L. Theraja, S.Chand (2007) 3. Principles of Electronics – V.K.Mehta, Rohit Mehta, S.Chand& Co New Delhi (2013) 4. Microelectronics –Jacob Millman –McGraw-Hill.
Ref. books	1. Functional Electronics – Ramanan –TMH, 1994. 2. The fundamentals of Solid state physics – Theraja Sultan Chand & Co., Delhi.

COURSE OUTCOMES:

At the end of the course, the student will be able to:

CO1	Able to Distinguish between Conductors - Insulators and semiconductors
CO2	Outline the basic foundation of PNP and NPN Transistors and transistor action

CO3	Summarize about the basic concepts of spontaneous and stimulated emission and optical pumping, population inversion and Meta stable state
CO4	To describe the concepts of Photo electric effect and Laws of Photo electric effect, Photo electric cell and photo transistors
CO5	Summarize the Basic Operational amplifier, Inverting and Non inverting Operational amplifier.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Course Outcomes (COs) ↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	3	2	2	2	3	2	3	2	2	2.3
CO-2	3	3	3	2	2	3	2	2	2	1	2.3
CO-3	3	3	2	3	2	3	3	2	2	1	2.4
CO-4	3	3	3	3	2	3	3	2	2	1	2.5
CO-5	3	3	2	3	2	2	3	2	2	3	2.5
Mean Overall Score											2.4 (High)

METHOD OF EVALUATION:

Continuous Internal Assessment	End Semester Examination	Total	Grade
30	70	100	

Question Paper Pattern

Maximum Marks: 70 Marks

Exam Duration: 3 Hrs

Part-A 10×2=20 Marks Answer ALL Questions (Two questions from each unit)

Part-B 5×4=20 Marks Answer ALL Questions (Either or Type-Two questions from each unit)

Part-C 3×10=30 Marks Answer Any Three Questions (Three out of Five-one question from each unit)

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	SEC1	Semester - III	Course Code: B3PHSE1
Course Title	FIRST AID AND EMERGENCY CARE		
Credits – 2	Instruction Hours - 2		Medium : English and Tamil
Course Objectives	To understand their role as an emergency first aider. To understand the use of risk assessments for health and safety purposes. To understand how to respond to accidents and sudden illness. To gain the knowledge on poisoning and bites. To learn the first aid kits used in clinical.		

UNITS	COURSE DETAILS
Unit - I	INTRODUCTION: Rules of First Aid – Principles and objectives of first aid examination of patient – Assessment- Priorities of first aid – Patient management and care.
Unit - II	FIRST AID ROOMS AND EQUIPMENTS: First aid kits, cleaning of wounds and dressing injury assessment.
Unit - III	MANAGEMENT: Management of common illness and thermal illness – Risk assessment and risk reductions – Fainting, Anaphylaxis, Asthma, and Epilepsy, Diabetes, burns and Scalds.
Unit - IV	INJURIES: Internal and external bleeding injuries to muscles, back, chest abdomen, joints, and bones, strokes and head injury and eye irrigation – Sudden illness – poisoning, Bites and Stings.
Unit - V	ACCIDENT REPORTING: Breathing emergencies, cardiac emergencies – Oxygen therapy- resuscitation, defibrillation – Heart attack – Common gastrointestinal sickness.
Text Books	1. First Aid to the Injured-Authorized manual of St John's Ambulance, Red cross road John A Eastman, New Delhi . 2007 2. Manual of First Aid. Jaypee Brothers, Medical Publishers Pp-441 Abhitabh Gupta 2003.
Ref. books	1. Karesh Prasad, 2012. First Aid for Nurses. Jaypee Publishers, New Delhi.
Web Resources	1. https://www.indianredcross.org/fmr/Module2.pdf 2. https://www.ncbi.nlm.nih.gov/books/NBK222964/

COURSE OUTCOMES:

At the end of the course, the student will be able to:

CO1	Know what is first aid and able to examine the patient who is in need of first air.
CO2	Administer first aid to an adult casualty who is unconscious (including seizure) cardiopulmonary resuscitation to an adult, including using an AED.
CO3	Administering first aid to who is wounded and bleeding.
CO4	Administering first aid to an adult casualty who is suffering from heart attack and provide oxygen therapy.
CO5	Know the first aid room and equipments.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Course Outcomes (COs) ↓	Programme Outcomes (PO)					Programme Specific Outcomes (PSO)					Mean Score of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	3	2	3	2	2	2	2	2	2	3	2.3
CO-2	3	2	2	2	3	2	2	3	2	2	2.3
CO-3	2	2	2	2	2	3	2	2	2	2	2.1
CO-4	3	3	3	2	3	2	2	2	2	3	2.5
CO-5	2	2	3	2	3	3	2	2	2	2	2.3
Mean Overall Score											2.3 (High)

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	SEC2	Semester - IV	Course Code: B4PHSE2
Course Title	DOMESTIC APPLIANCES		
Credits -2	Instruction Hours -2		Medium : English and Tamil
Course Objectives	To get knowledge of how domestic electric devices work. To understand and acquire skills on the working of heating and lighting appliances.		

UNITS	COURSE DETAILS
Unit - I	FUNDAMENTALS OF ELECTRICITY: Electricity – Charge-Electric current –Direction of flow of current –Resistance – series and parallel -Ohms law-Kirchhoff's law.
Unit - II	ELECTRIC COMPONENTS AND MEASURING INSTRUMENTS: Conductor - Insulator - Resistor -Capacitor - Galvanometer -Ammeter - Voltmeter - Ohm meter-AVO meter (multimeter) - Watt - Watt hour meter - Commercial electrical billing(problem)-Line tester.
Unit - III	HEATING AND LIGHTING APPLIANCES: Electric iron box-Electric hotplate - Room Heater - Immersion heater-Geyser-CFL, LED lamps.
Unit - IV	MODERN ELECTRICAL APPLIANCES: Design and working of basic Water motors - Fan - Refrigerator - Air Conditioning –Wet grinder - Microwave oven - Hair drier- vacuum cleaner.
Unit - V	STAND BY DEVICES AND SAFETY MEASURES Switch - Fuse – Standard Wire Gauge - Miniature circuit breaker (MCB) - Earthing – Uninterrupted Power Supply - Inverter. Electric shock and its effects -Symptoms andfirst aid - Safety tips - Home repair safety tips - Tips for conserving electricity.
Text Books	1. Basic Electrical Engineering - M.L.Anwani&I.AnwaniDhanpatRai and Co. New Delhi , 2012 . 2. Domestic Electric Appliances - General Interest book from market shelf. 3. Electrical Appliances –Complete Guide to the maintenance and repair of Domestic Electrical Appliances- Graham Dixon.
Ref. books	1. Domestic Electrical Appliances-Thomas Anthony Buchanan Corley-Cape, 1996 2. Domestic Electrical Appliances (Motor type)-Ministry of Commerce & Industry-Govt. of India.
Web Resources	1. http://www.howstuffworks.com . 2. http://www.answers.com 3. http://www.wikipedia.org

COURSE OUTCOMES:

At the end of the course, the student will be able to:

CO1	Know the fundamentals of Electricity
CO2	Know various electrical components and measuring instruments.
CO3	Acquire knowledge on heating and lighting appliances.
CO4	Know the working of modern electrical appliances.
CO5	Understand the working of Stand by Devises. Know the methods to conserve Electricity

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Course Outcomes (COs)↓	Programme Outcomes (PO)					Programme Specific Outcomes(PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	2	3	2	2	3	2	3	2	3	2	2.4
CO-2	2	2	3	2	3	3	2	3	2	2	2.3
CO-3	2	3	2	3	2	2	3	2	3	2	2.4
CO-4	2	2	3	2	3	3	2	3	2	3	2.5
CO-5	2	2	2	3	2	2	2	3	2	2	2.2
Mean Overall Score											2.36 (High)

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	SEC3	Semester - V	Course Code: B5PHSE3
Course Title	HOUSE WIRING		
Credits -2	Instruction Hours - 2		Medium: English and Tamil
Course Objectives	To understand the fundamental concepts of house wiring		

UNITS	COURSE DETAILS
Unit - I	WIRES: Wires – Stranded wires – Types of wires – Lead sheathed wire – TRS (or) CTS wires- Weather proof wires – Flexible wires – Wire splicing and termination – Western union splice (or) twist splice.
Unit - II	SWITCHES: Symbols of electrical and connecting accessories – Switches – Surface switch (or) Tumbler switch – Pull switch (or) Ceiling switch – Grid switch – Architrave switch – Main switch – Splitter units – Distribution fuse boards – Circuit breaker
Unit - III	FUSE AND LAMP HOLDERS: Fuse – Principle of operation – Melting points of various metals – Silver as a fusing element – Copper as a fuse wire. Lamp holder – Switched bayonet cap lamp holders – Swivel lamp holders – Ceiling rose – Plugs.
Unit - IV	WIRING AND EARTHING: General rules related to wiring - Wiring tools – materials – procedure –safety and precaution- layout diagram – one lamp from one switch– Single phase and three phase wiring–Earthing – Neutral wire – Requirement for grounding – Methods of Earthing – Earthing through water main pipe – plate Earthing.
Unit - V	TESTING : Testing procedures – Insulation and leakage test – continuity test – open circuit test – short circuit test – polarity test – Earthing system test.
Unit - VI	PROFESSIONAL COMPONENTS: expert lectures –seminars — webinars – industry inputs – social accountability – patriotism
Text Books	1. Electrical wiring, Estimating and Costing – S.L.Uppal, Khanna Publications, Delhi, 2006.
Ref. Book	1. House wiring – Ramanathan Publications, 2014. 2. Electrical wiring residential – Ray.C.Mullin.Phil Simmons, Delmar, Cengage learning, 2012.

COURSE OUTCOMES:

At the end of the course, the student will be able to:

CO1	Acquire basic skills on House wiring.
CO2	Gain knowledge about the different types of switches.
CO3	Understand the knowledge about the principle and operation of fuse.
CO4	Gain the knowledge of house wiring and earthing
CO5	Understand the testing procedures.

Relationship matrix for Course outcomes, Programme outcomes /Programme Specific Outcomes

Course Outcomes (COs)↓	Programme Outcomes (PO)					Programme Specific Outcomes(PSO)					Mean Scores of COs
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	
CO-1	2	3	2	2	2	2	3	1	3	2	2.2
CO-2	2	3	2	3	2	2	2	3	2	3	2.4
CO-3	2	3	2	2	2	2	2	3	3	1	2.2
CO-4	2	3	1	3	3	2	3	1	3	3	2.4
CO-5	2	3	1	2	1	2	3	3	3	2	2.2
MeanOverallScore											2.28 (High)

HOD

COE

(For the candidates admitted 2026 – 2027 onwards)

Course	PCS	Semester - VI	Course Code: B6PHSE4
Course Title	PROFESSIONAL COMPETENCY SKILL		
Credits -2	Instruction Hours - 2		Medium : English and Tamil
Course Objectives	To develop the personality development and to improve the skills needed for the employment opportunities		

UNITS	Course Details
Unit - I	KNOW YOURSELF: Knowing yourself – Positive thinking – Physical fitness – Emotional Intelligence – Skills to develop emotional intelligence.
Unit - II	RESUME WRITING: Resume writing - purpose of a resume – How long should my resume job? – Types of Resume – Chronological Resume, Functional Resume, Combination Resume, Infographic Resume, Resume with profile, Targeted Resume, mini Resume, Non-traditional resume – Things to do – Formats of Resume – Job Application or covering letter.
Unit - III	GROUP DISCUSSION: Introduction – Types of Group discussions – Difference between group discussion and panel discussion debate – personality traits – Advantages of Group discussion – Dos and Don'ts.
Unit - IV	INTERVIEW SKILLS: Introduction – Types of interviews – Preparatory steps for job interview– Interview skills – punctuality – Think before you speak – clarity – being confident – Listening – Expressing optimism – Body language – Showing interest – Communication skills – Expressing gratitude.
Unit - V	PROFESSIONAL SKILLS: Creativity at work place – Ethical values – Capacity building, Developing interpersonal relationship -Leadership and team building – Decision making – Stress and Time management
Text Books	1) ICTACT – Soft skills and Industry awareness – Tamil Nadu state council for Higher Education, Department of Higher Education – ICT Academy of Tamil Nadu, Chennai. 2) Soft Skills: An integrated approach to maximize personality, GajendraS.Chauhan, Sangeetha Sharma, Wiley India.

COURSE OUTCOMES:

At the end of the course, the student will be able to:

CO1	Acquire the knowledge about the personality development.	K2
CO2	Gain the knowledge about various types of resumes and resume writing.	K2
CO3	Able to face the first step of interview on gaining the group discussion skills	K3
CO4	Acquire interview skills and understand about body language.	K4
CO5	Gain the professional skills for employability and leadership.	K3
K1 - Remember; K2 – Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate;		

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	2	2	2	2	3	3	3	3	2
CO2	2	3	2	2	3	3	2	3	2	2
CO3	3	2	3	3	3	2	3	2	3	2
CO4	3	2	3	3	2	3	3	3	3	2
CO5	2	2	2	2	3	3	2	2	2	2

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6	PSO7	PSO8	PSO9	PSO10
CO1	3	2	3	3	2	3	3	3	3	2
CO2	3	2	3	3	3	2	3	2	3	2
CO3	2	2	2	2	2	3	3	3	3	2
CO4	2	3	2	2	3	3	2	3	2	2
CO5	2	2	2	2	3	3	2	2	2	2

HOD

COE