DEPARTMENT OF PHYSICS

B.Sc. Physics
Courses offered

Semester	Course	Subject code	Paper	Hours/ week	Credit
I	**Part I**	TL1711/ FL1711	Language: Tamil/French	6	3
	Part II	GE1711 / GE1712	General English (A Stream / B Stream)	6	3
	Part III	PC1711	Major Core I - Mechanics and Properties of Matter	4	4
		PC17P1	Major Practical I - Physics Lab I	2	-
		AP1711/ AP1731	Allied I – Allied Physics – I	4	4
		AP17P1	Allied Practical – General Physics Lab	2	-
	Part IV	AEC171	Ability Enhancement Compulsory Course (AECC): English Communication	2	2
		PNM171	Non Major Elective Course (NMEC) – Everyday Physics I	4	2
		VEC172	Foundation Course I – Values for Life	-	-
	Part V	SDP172	Skill Development Programme(SDP) –Certificate course	-	-
		STP174	Student Training Programme (STP) – Clubs and Committees/NSS	-	-
II	**Part I**	TL1721/ FL1721	Language: Tamil/French	6	3
	Part II	GE1721 / GE1722	General English (A Stream / B Stream)	6	3
	Part III	PC1721	Major Core II –Thermal Physics and Sound	4	4
		PC17P1	Major Practical I - Physics Lab I	-	2
		PC17P2	Major Practical II - Physics Lab II	2	2
		AP1721/ AP1741	Allied II – Allied Physics - II	4	4
		AP17P1	Allied Practical – General Physics Lab	2	2
	Part IV	AEC172	Ability Enhancement Compulsory Course (AECC): Environmental Studies	2	2
		PNM172	Non Major Elective Course (NMEC) – Every Day Physics II	4	2
		VEC172	Foundation Course I – Values for Life	-	1
	Part V	SDP172	Skill Development Programme (SDP) –Certificate course	-	1
		STP174	Student Training Programme (STP) – Clubs and Committees/NSS	-	-

III	**Part I**	TL1731/ FL1731	Language: Tamil/French	6	3
	Part II	GE1731/ GE1732	General English (A Stream / B Stream)	6	3
	Part III	PC1731	Major Core III – Electricity and Magnetism	4	4
		PC1732 PC1733 PC1734	Major – Elective - I (a) Non Conventional energy Sources/ (b) Medical Physics/ (c) Physics of the earth	4	4
		PC17P3	Major Practical III - Physics Lab III	2	-
		AP1711/ AP1731	Allied I – Allied Physics - I	4	4
		AP17P1	Allied Practical – General Physics Lab	2	-
	Part IV	SBC173/ SBC174	Skill Based Course (SBC) – Yoga / Computer Literacy	2	2
		VEC174	Foundation Course II – Personality Development	-	-
	Part V	STP174	Student Training Programme (STP) – Clubs and Committees/NSS	-	-
		SLP173	Service Learning Programme (SLP): Extension Activity (RUN)	-	1
IV	**Part I**	TL1741/ FL1741	Language: Tamil/French	6	3
	Part II	GE1741 / GE1742	General English (A Stream / B Stream)	6	3
	Part III	PC1741	Major Core IV – Analog System and Application	4	4
		PC1742 PC1743 PC1744	Major – Elective - II (a) Fiber Optics/ (b) Microprocessor/ (c) Communication System	4	4
		PC17P3	Major Practical III - Physics Lab III	-	2
		PC17P4	Major Practical IV - Physics Lab IV	2	2
		AP1721/ AP1741	Allied II – Allied Physics - II	4	4
		AP17P1	Allied Practical – General Physics Lab	2	2
	Part IV	SBC173/ SBC174	Skill Based Course (SBC) – Yoga / Computer Literacy	2	2
		VEC174	Foundation Course II – Personality Development	-	1
	Part V	STP174	Student Training Programme (STP) - Clubs and Committees/NSS	-	1
V	**Part III**	PC1751	Major Core V - Element of Modern Physics	6	5
		PC1752	Major Core VI - Optics	6	5
		PC1753	Major Core VII - Solid State Physics	5	5
		PC1754 PC1755 PC1756	Major – Elective - III (a) Programming with C++/ (b) Applied Physics/ (c) Bio Physics	5	4

		PC17P5	Major Practical V - Physics Lab V	4	-
		PC17P6	Major Practical VI - Physics Lab VI	2	-
	Part IV	PSK175	Skill Based Course (*SBC) – Basic Electrical circuits and Instruments	2	2
		HRE175	Foundation Course III - Human Rights Education (HRE)	-	1
VI	**Part III**	PC1761	Major Core VIII – Mathematical Methods of Physics	6	5
		PC1762	Major Core IX - Digital System and Application	6	5
		PC1763	Major Core X - Nuclear Physics	5	5
		PC1764 PC1765 PC1766	Major – Elective - IV (a) Nanomaterial and its application/ (b) Basic Astrophysics/ (c) Digital Signal Processing	5	4
		PC17P5	Major Practical V - Physics Lab V	-	2
		PC17P6	Major Practical VI - Physics Lab VI	2	2
		PC17P7	Major Practical VII - Physics Lab VII	4	2
	Part IV	PSK176	Skill Based Course (*SBC) – Project	2	2
		WSC176	Foundation Course IV - Women's Studies (WS)	-	1
			TOTAL	**180**	**140+3**

B.Sc. Programme Outcomes (POs)

PO	Upon completion of B.Sc. Degree Programme, the graduates will be able to :
PO - 1	Apply the acquired scientific knowledge to face day to day needs.
PO - 2	Create innovative ideas through laboratory experiments.
PO - 3	Carry out field works and projects independently and in collaboration with other institution.
PO - 4	Reflect upon green initiatives and take responsible steps to build a sustainable environment.
PO - 5	Face challenging competitive examinations that offer rewarding careers in science and education.
PO - 6	Impart communicative skills and ethical values.
PO - 7	Equip students with hands on training through various courses to enhance entrepreneurship skills.

B.Sc. Physics Programme Specific Outcomes (PSOs)

PSO	Upon completion of B.Sc. Degree Programme, the graduates of Physics will be able to :	PO
PSO - 1	Understand the core theories and principles of physics which include mechanics, thermodynamics, electronics, material science etc.	PO - 1
PSO - 2	Develop extensive comprehension of fundamental and diverse applications of Physics.	PO - 2
PSO - 3	Apply knowledge of principles, concepts in Physics and analyze their local, national and global impact.	PO - 3
PSO - 4	Apply the critical reasoning and computing skills to analyze and solve problems in physics.	PO - 5
PSO - 5	Analyze the observed experimental data and relate the results with theoretical expectations.	PO - 3
PSO - 6	Communicate appropriately and effectively, in a scientific context using present technology.	PO - 1
PSO - 7	Develop entrepreneurial skills, empowered according to the professional requirement and become self-dependent.	PO - 7
PSO - 8	Understand the professional, ethical, legal, security, social issues and responsibilities.	PO - 6

Course Outcomes (COs)

Semester : I   **Major Core I**

Name of the Course : Mechanics and Properties of Matter

Course code : PC1711

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Understand the fundamentals of dynamics.	PSO - 1	U
CO - 2	Explain the conservation laws.	PSO - 2	U
CO - 3	Apply the concept of moment of inertia to objects of different shapes.	PSO - 4	A
CO - 4	Distinguish elastic and inelastic collisions and discuss about the centre of pressure and Bernoulli's theorem.	PSO - 2	An
CO - 5	Explain the different moduli of elasticity.	PSO - 1	U
CO - 6	Analyze the various properties of liquids.	PSO - 4	An

Semester : I/III   **Allied - I**

Name of the Course : Allied Physics I

Course code : AP1711/ AP1731

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Interpret simple systems undergoing simple harmonic motion and derive equations of motion.	PSO - 1	U
CO - 2	Demonstrate the bending moment diagrams (Distinguish different type of bending).	PSO - 2	U
CO - 3	Explain the properties and behavior of fluids under various conditions.	PSO - 2	Ap
CO - 4	Distinguish between the characteristics and features of various phenomena of light. (Interference, diffraction, polarization, double refraction, specific rotation)	PSO - 3	An
CO - 5	Analyze and study the applications of dispersion and refraction through a prism.	PSO - 5	Ap

Semester   **: I**   **NMEC-I**

Name of the Course   **: Physics Everyday-I**

Course code   **: PNM171**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Understand their knowledge of basic scientific principles and fundamental concepts in physics.	PSO - 2	U
CO - 2	Recall various laws in physics (Newton, Archimedas, conservation, gravitation) applied in day today lie situation.	PSO - 1	R
CO - 3	Identify basic physics principles of instruments (veena, violin, guitar, drum, flute) and devices(thermometer, refrigerator).	PSO - 3	Ap
CO - 4	Explain safety measure for using electricity.	PSO - 6	E
CO - 5	Elaborate the properties and application of light.	PSO - 1	C

Semester   **: II**   **Major Core-II**

Name of the Course   **: Thermal Physics and Sound**

Course code   **: PC1721**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Recall the concept of kinetic theory of gases.	PSO - 1	R
CO - 2	Apply the laws of thermodynamics on heat phenomena.	PSO - 3	Ap
CO - 3	Estimate the experimental methods of transmission of heat. (Lee's disc, Newton's law of cooling, Specific heat capacity of cooling)	PSO - 5	E
CO - 4	Correlate the concept of simple harmonic motion with vibration of strings.	PSO - 2	An
CO - 5	Discuss ultrasonics and the factors affecting the architectural acoustics.	PSO - 6	U

Semester   : II/IV   **Allied - II**

Name of the Course   : Allied Physics II

Course code   : AP1721 /AP1741

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Discuss the conduction, convection and radiation phenomenon in heat transfer processes.	PSO - 1	C
CO - 2	Determine the significance of steady current and alternating current.	PSO - 2	E
CO - 3	Explain the fundamental concepts of electromagnetism and apply it to determine the mutual inductance.	PSO - 3	U, Ap
CO - 4	Understand the basic ideas in diodes and transistors.	PSO - 7	R
CO - 5	Discuss the basic digital operations.	PSO - 5	C
CO - 6	Apply Kirchoff's laws to simple electrical circuits.	PSO - 5	A

Semester   : II   **NMEC-II**

Name of the Course   : Physics Everyday-II

Course code   : PNM172

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Understand the principle and working of simple devices in physics.	PSO - 1	U
CO - 2	Elaborate various energy sources (hydro, wind, biomass, geothermal).	PSO - 2	C
CO - 3	Explain the physical principles used in instruments.	PSO - 3	E
CO - 4	Distinguish different heavenly bodies (star, planet, comets, galaxies).	PSO - 4	An
CO - 5	Recall various concepts in physics	PSO - 5	R

Semester   **: I**   **Major Practical I**

Name of the Course   **: Physics Lab-I**

Course code   **: PC17P1**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Apply the theory of elasticity in determining the Young's Modulus of the given material by bending experiments.	PSO - 3	Ap
CO - 2	Revise the perpendicular axes theorem using bifilar pendulum.	PSO - 2	An
CO - 3	Illustrate the principle of fluid dynamics by demonstration of experiments. (Poiseuille's method and Stoke's method)	PSO - 1,4	Ap
CO - 4	Evaluate the rigidity modulus of torsion pendulum through a simple experiment.	PSO - 2	E
CO - 5	Design a record of an experiment in written form with required figures and graphs.	PSO - 7	C

Semester   **: II**   **Major Practical II**

Name of the Course   **: Physics Lab-II**

Course code   **: PC17P2**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Demonstrate the phenomena of thermal conductivity in good and bad conductor. (Forbe's method, Lee's disc method)	PSO - 1	U
CO - 2	Apply the laws of transverse vibration and estimate the frequency of A.C mains using sonometer.	PSO - 4,3,5	Ap, E
CO - 3	Interpret the principle involved in the formation of Lissajous figures using oscillators.	PSO - 1	An
CO - 4	Understand the concept and characteristics of sound through experiments.	PSO - 5	U
CO - 5	Organize and present the performed experiments in graphical format.	PSO - 7	C

Semester   **: I & II / III&IV**   **Allied Practical**

Name of the Course   **: General Physics Lab**

Course code   **: AP17P1/AP17P3**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Understand the basic principles of Physics through experiments.	PSO - 1	U
CO - 2	Measure and determine the various physical parameters.	PSO - 5	An
CO - 3	Develop an idea about the handling of various instruments.	PSO - 7	C
CO - 4	Get an idea about basic Scientific knowledge and implications of its broad working principle.	PSO - 3	Ap
CO - 5	Analysing, interpreting and evaluating data.	PSO - 5	E
CO - 6	Build a foundation in Scientific Career.	PSO - 2	Ap

Semester   **: III**   **Major Core-III**

Name of the Course   **: Electricity and Magnetism**

Course code   **: PC1731**

CO	Upon completion of this course the students will be able to:	PSO addressed	CL
CO - 1	Explain the concept and features of the electrostatic force (Coulomb force), magnetic field, flux, force, the electric force field, Gauss's Law and its application (charged sphere, cylinder, plane sheet).	PSO - 1	U
CO - 2	Analyse the presence of electric potential and potential difference, within a framework of distributed symmetric charge distributions.	PSO - 2	An
CO - 3	Solve problems associated with the effect of uniform magnetic fields on moving charges and current-carrying wires, loops and the magnetic dipole.	PSO - 3	C
CO - 4	Understand the laws of electromagnetic induction as applied to self and mutual induction.	PSO - 3	U
CO - 5	Analyse AC circuit behavior. (LR,CR and LCR)	PSO - 5	An
CO - 6	Apply kirchoff's laws and network theorems to electrical circuits.	PSO - 2	A
CO - 7	Determine magnetic dipole moment using magnetometers and AC bridges, and Ballistic galvanometer to do electrical measurements.	PSO - 5	E

Semester   **: III**   **Elective-I (a)**

Name of the Course   **: Non – Conventional Energy Sources**

Course code   **: PC1732**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Understand the utilization of solar energy for generating the power.	PSO - 8	Ap
CO - 2	Apply the solar energy in various sectors. (industry, agriculture and domestic purposes)	PSO - 3	Ap
CO - 3	Explain the basic principles of wind energy conversion, its components and its classification.	PSO - 1	U
CO - 4	Explain the various Biomass conversion Processes.	PSO - 7	U
CO - 5	Discuss the geothermal energy resources and chemical energy resources. (fuel cells)	PSO - 2	An
CO - 6	Outline the extraction of useful energy from Earth, Ocean, Wind and Sun.	PSO - 3	Ap
CO - 7	Design the various pollution-free energy resources.(solar heater, solar cooker, Wind mill etc)	PSO - 7	C
CO - 8	Solve the present and future energy crisis.	PSO - 8	C

Semester   **: III**   **Elective-I (b)**

Name of the Course   **: Medical Physics**

Course code   **: PC1733**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Understand the Anatomical terms of the body.	PSO - 2	U
CO - 2	Explain the physical dynamics of the body .	PSO - 2	Ap
CO - 3	Analyse the heat and pressure system of the body.	PSO - 5	An
CO - 4	Discuss the optical, electrical and acoustical behavior of the human body.	PSO - 8	An
CO - 5	Gain knowledge and application ideas regarding radiations and diagnostic systems.	PSO - 2	Ap
CO - 6	Identify the radiation units and will be able to measure the radiation dose.	PSO - 2	Ap

Semester   : III   **Elective-I (c)**

Name of the Course   : Physics of Earth

Course code   : PC1734

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Understand the scientific ideas of how the universe formed and how it is expanding.	PSO - 1	U
CO - 2	Discuss the general characteristics and origin of Universe.	PSO - 2	Ap
CO - 3	Explain the physical dimensions and the internal structure of the earth.	PSO - 3	Ap
CO - 4	Discuss the various regions in earth (Hydrosphere, Atmosphere, Cryosphere and Bio-sphere).	PSO - 3	An
CO - 5	Explain the dynamical processes that happen in earth.	PSO - 3	An
CO - 6	Analyse the earth's temperature change processes at local to global scales.	PSO - 3	An
CO - 7	Discuss the evolution of life on earth and its role in shaping the environment.	PSO - 3	C

Semester   : IV   **Major Core-IV**

Name of the Course   : **Analog Systems and Applications**

Course code   : **PC1741**

CO	Upon completion of this course the students will be able to:	PSO addressed	CL
CO - 1	Understand the basics of semiconductor physics for intrinsic and extrinsic materials.	PSO - 1	U
CO - 2	Examine the operation, features and parameters related to diodes, transistor, and interpret their applications. (P-N diode, zener diode, transistor)	PSO - 2	An
CO - 3	Justify the function of semiconductor diodes in filter and bridge circuits.	PSO - 3	E
CO - 4	Design amplifier circuits with and without feedback.	PSO - 7	C
CO - 5	Analyse the different types of oscillators based on their circuit design. (LC,RC,RC phase shift, Wien bridge, crystal)	PSO - 5	An
CO - 6	Analyse the characteristics and various applications of the op-amp.	PSO - 2	An

Semester   **: IV**   **Elective- II (a)**

Name of the Course   **: Fibre Optics**

Course code   **: PC1742**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Explain the various methods of propagation of light waves through various types of fibres.	PSO - 4	U
CO - 2	Explain the structure and performance of LEDS and Lasers.	PSO - 2	U
CO - 3	Classify the optical sources and detectors and to discuss their principle.	PSO - 1	U
CO - 4	Discuss the channel impairments such as losses and dispersion.	PSO - 5	C
CO - 5	Analyse various coupling losses.	PSO - 7	An
CO - 6	Understand and compare operation, principles, characteristics, design architecture of modulators and detectors of light.	PSO - 6	U

Semester   **: IV**   **Elective- II (b)**

Name of the Course   **: Microprocessor**

Course code   **: PC1743**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Explain the architecture of 8085 microprocessor.	PSO - 1	U
CO - 2	Analyze the instruction set of 8085 microprocessor.	PSO - 2	An
CO - 3	Develop skill in writing simple programs for 8085 microprocessor.	PSO - 4	A
CO - 4	Examine the programming techniques with additional instructions.	PSO - 2	An
CO - 5	Analyze the 8085 microprocessor applications. (counters and Generation of waves forms)	PSO - 3	An

Semester : IV   **Elective- II (c)**

Name of the Course : Communication System

Course code : PC1744

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Understand the basic ideas regarding modulation in communication system.	PSO - 1	R, U
CO - 2	Understand the frequency and pulse modulation and explain its detection.	PSO - 4	U, E
CO - 3	Identify and apply appropriate techniques, resources and to solve problems in mobile communication system.	PSO - 7	Ap
CO - 4	Develop the ideas in Satellite Communication.	PSO - 6	C
CO - 5	Apply the technical skills and modern tools in electronic communication systems.	PSO - 3	Ap

Semester : III   **Major Practical III**

Name of the Course : Physics Lab-III

Course code : PC17P3

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Understand the scientific method and an ability to apply the scientific method in practice.	PSO - 1	U
CO - 2	Understand the theory of Ballistic galvanometer by doing experiments	PSO - 3	U, Ap
CO - 3	Recall the basic experiments; improve the basic skills and attitude which help them to apply these skills in their field of physics	PSO - 3	R
CO - 4	Understand the practical knowledge of various bridges (Desauty's and Owen's bridge) by demonstration of experiments	PSO - 1	U
CO - 5	Determine the resonant frequency and Q value of a series and parallel LCR circuit and be able to verify the Thevinins and Nortons theorem.	PSO - 2	Ev
CO - 6	Compile a record of an experiment in a clear and logical written form (e.g., lab manual report, Record) augmented with figures and graphs where appropriate.	PSO - 5	C

Semester   **: IV**   **Major Practical IV**

Name of the Course   **: Physics Lab-IV**

Course code   **: PC17P4**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Develop the basic experiments; improve basic skills and attitude which help them to apply these skills in their field of physics.	PSO - 2	U
CO - 2	Understand the principle and working of analog electronic circuits (Zener diode, Bridge rectifier) through some basic experiments	PSO - 1	U
CO - 3	Analyze the physical principle involved in the various instruments and design simple circuits for amplifiers (single stage CE amplifier with and without feedback).	PSO - 5	An
CO - 4	Construct simple circuits containing operational amplifiers such as adder and subtractor, differentiator and integrator.	PSO - 4	Cr
CO - 5	Apply conceptual understanding of the physics to general real-world situations;develop interpersonal and communication skills including communicating in small groups, writing, working effectively with peers.	PSO - 3	Ap

Semester   **: V**   **Major Core - V**

Name of the Course   **: Elements of Modern Physics**

Course code   **: PC1751**

CO	Upon completion of this course the students will be able to:	PSO addressed	CL
CO - 1	Explain the theories and experiment related to particle and wave nature of particles.	PSO - 1	U
CO - 2	Identify particle nature experiments (photo electric effect, planks law, Compton effect, photoelectric effect) and wave nature experiments.(Thomson experiment, division germer experiment).	PSO - 2	Ap
CO - 3	Define uncertainty principle.	PSO - 2	R
CO - 4	Analyse various models of atomic spectra.	PSO - 5	An
CO - 5	Solve Schrodinger equation in different dimensional stages.	PSO - 4	C
CO - 6	Estimate Lorentz transformation for length contraction, time dilation.	PSO - 5	E

Semester   **: V**   **Major Core - VI**

Name of the Course   **: Optics**

Course code   **: PC1752**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Explain the fundamental principle of optics.	PSO - 1	U
CO - 2	Determine the behavior of a ray at any optical surface (lenses, Prisms).	PSO - 6	E
CO - 3	Explain the types of waves and its characteristics.	PSO - 2	U
CO - 4	Analyze the intensity variation of light due to polarization, interference and diffraction.	PSO - 3	An
CO - 5	Distinguish Interference, diffraction and polarization.	PSO - 2	An
CO - 6	Test the optical planeness of any optical surface.	PSO - 6	C
CO - 7	Measure the various optical parameters. (focal length, power, refractive index, radius of curvature, dispersive power etc) using optical components (prism, lenses, glass plate, grating).	PSO - 4	E
CO - 8	Understand the interference and diffraction from wave optics concepts and know its applications. Understand polarization of light and its applications.	PSO - 1	U

Semester   **: V**   **Major Core - VII**

Name of the Course   **: Solid State Physics**

Course code   **: PC1753**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Illustrate various types of bonding present in solids with example.	PSO - 1	U
CO - 2	Explain the various crystal parameters and structures.	PSO - 3	E
CO - 3	Discuss the various theories involved in magnetic materials. (dia, para, ferro, ferri and antiferro magnetism)	PSO - 3	C
CO - 4	Describe polarization processes and analyze the information contained in the temperature and frequency dependence of dielectric materials.	PSO - 1	C
CO - 5	Analyze the structure and physical properties of semiconductors.	PSO - 5	An
CO - 6	Describe and discuss the theory of superconductivity and superconducting materials.	PSO - 2	C

Semester   : V   **Elective- III (a)**

Name of the Course   : **Programming with C++**

Course code   : **PC1754**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Describe the principles of object oriented program. (abstraction, encapsulation, inheritance and polymorphism)	PSO - 4	C
CO - 2	Apply object oriented programming techniques to solve computing problems.	PSO - 4	Ap
CO - 3	Develop programs using functions and classes. (objects, array of objects, friend functions, passing and returning objects)	PSO - 4	C
CO - 4	Develop programs using constructor, destructor, operator overloading and inheritance.	PSO - 4	C
CO - 5	Formulate the applications of pointers and virtual functions.	PSO - 4	C
CO - 6	Distinguish formatted and unformatted I/O operations.	PSO - 4	An

Semester   : V   **Elective- III (b)**

Name of the Course   : **Applied Physics**

Course code   : **PC1755**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Understand the general Physics principles of instruments used in the medical field.	PSO - 1	U
CO - 2	Explain the use of non ionizing radiation in imaging the body.	PSO - 3	E
CO - 3	Outline various features and behavioral activity of the Sun and heavenly bodies of solar system.	PSO - 2	U
CO - 4	Discuss the transformation and characteristics of fiber and its manufacturing techniques.	PSO - 5	C
CO - 5	Interpret the technique involved in camera, television, etc.	PSO - 8	U
CO - 6	Explain the principles, concepts and operation of satellite communication.	PSO - 3	E

Semester   **: V**   **Elective- III (c)**

Name of the Course   **: Bio Physics**

Course code   **: PC1756**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Explain atomic and molecular structure of biomolecules.	PSO - 3	E
CO - 2	Interpret the structure of cells and the major components within a cell.	PSO - 2	U
CO - 3	Discuss the importance of diffusion, random walks, entropy and self-assembly in biological systems.	PSO - 3	C
CO - 4	Illustrate the models of cellular dynamics.	PSO - 2	U
CO - 5	Describe stem cell and brain structure.	PSO - 3	C
CO - 6	Explain the core concepts of biological literacy. (evolution, biological structure-function relationships, information flow pathways and transformations of energy and matter)	PSO - 3	E

Semester   **: V**   **SBC**

Name of the Course   **: Basic Electrical circuits and Instruments**

Course code   **: PSK175**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Recall the basic definitions and units of electrical quantities.	PSO - 1	R
CO - 2	Analyze the circuit elements and their connections.	PSO - 2	An
CO - 3	Understand various power generation methods.	PSO - 2	U
CO - 4	Develop their own circuits using electrical wiring.	PSO - 5	Ap
CO - 5	Compare the Physics concepts behind various electrical instruments and appliances. (Voltmeter, Ammeter, Multimeter, Incandescent lamp, Fluorescent bulb, Choke and Starter, Electric Iron)	PSO - 3	Ev
CO - 6	Demonstrate uses of tester & Multimeter, LDR, Microphone, loudspeaker, etc.	PSO - 6	U
CO - 7	Test for the working of electrical circuits and appliances. (music bell, electric fan, lamp controlled by switch, etc.,)	PSO - 5	An

Semester   : VI   **Major Core - VIII**

Name of the Course   : **Mathematical Methods of Physics**

Course code   : **PC1761**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Illustrate linear dependence and combination of vectors as quantities in Physics.	PSO - 4	U
CO - 2	Evaluate problems in matrices.	PSO - 4	E
CO - 3	Solve ordinary and partial differential equations related to Physical Science.	PSO - 2	C
CO - 4	Adapt Fourier transform technique to obtain the Fourier series of periodic functions of Physics.	PSO - 5	C
CO - 5	Understand and manipulate random variables using the theory of probability including tools of probability transformation and characteristic functions.	PSO - 6	U

Semester   : VI   **Major Core - IX**

Name of the Course   : **Digital System and Applications**

Course code   : **PC1762**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Understand the fundamental concepts and techniques used in Digital Electronics.	PSO - 4	U
CO - 2	Perform conversions among different number systems and apply in digital designing.	PSO - 2	Ap
CO - 3	Infer the basic logic gates, understand Boolean algebra and simplify simple Boolean functions by using basic Boolean properties.	PSO - 1	U
CO - 4	Understand, analyse and design various combinational and sequential circuits. (Flip flop, Counters, MUX, DEMUX, Encoder, Decoder etc.)	PSO - 5	Ap
CO - 5	Understand the architecture and operations of microprocessor 8085.	PSO - 7	U
CO - 6	Develop the basic idea about the instruction set and data transfer schemes.	PSO - 6	Ap

Semester   **: VI**   **Major Core - X**

Name of the Course   **: Nuclear Physics**

Course code   **: PC1763**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Define the fundamentals of nuclear matter. (properties of nuclei and Nuclear forces)	PSO - 2	R
CO - 2	Apply the principles of physics in the measurements of Nuclear size, Nuclear spin, Nuclear energy levels and Nuclear magnetic moment.	PSO - 1	Ap
CO - 3	Assess rradioactivity and various nnuclear reactions. (nuclear fission and fusion).	PSO - 3	E
CO - 4	Explain the decay modes, Radiation Detectors and Particle Accelerators. (Ionisation chamber, Proportional counter, Geiger Muller counter, Linear accelerator, Cyclotron, Synchro cyclotron, Betatron).	PSO - 5	U
CO - 5	Discuss the classification of elementary particles and Quark model.	PSO - 5	An
CO - 6	Analyse the characteristics and behavior of elementary particles and their fundamental interactions.	PSO - 7	U
CO - 7	Develop a deeper understanding of some important applications of nuclear physics in Nuclear Reactor and Source of stellar energy.	PSO - 4	C

Semester   **: VI**   **Elective- IV (a)**

Name of the Course   **: Nano material and its Applications**

Course code   **: PC1764**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Infer the history of nanotechnology and explain the various dimensions of nanostructures.	PSO - 1	U
CO - 2	Apply the characterization techniques of nanomaterials. (XRD,SEM,TEM and Analytical Electron Microscope)	PSO - 3	Ap
CO - 3	Explain the synthesis of nanomaterials and categorize their properties.	PSO - 2	E , An
CO - 4	Interpret quantum well, quantum wires and quantum dots.	PSO - 5	E
CO - 5	Explain the carbon nanotubes and its applications.	PSO - 6	E
CO - 6	Discuss the applications of nanotechnology in various fields.	PSO - 4	C

Semester   **: VI**   **Elective- IV (b)**

Name of the Course   **: Basic Astrophysics**

Course code   **: PC1765**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Identify the historical evolution of sun and planets.	PSO - 3	R
CO - 2	Apply the principles of physics in the measurements of distances, mass, radius, density and luminosity of stars.	PSO - 1	Ap
CO - 3	Compare the resolving power and light gathering power of an astronomical telescope.	PSO - 4	E
CO - 4	Explain the Physical characteristics of sun and other stars.	PSO - 6	U
CO - 5	Analyse the structure of the universe and milky way galaxy.	PSO - 5	An
CO - 6	Discuss the observations of Galaxies, dark matter, quasars and pulsars.	PSO - 2	U
CO - 7	Develop a deeper understanding of some important astronomical objects like binary stars, multiple stars, Neutron stars and Black holes.	PSO - 7	C

Semester   **: VI**   **Elective- IV (c)**

Name of the Course   **: Digital Signal Processing**

Course code   **: PC1766**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Formulate discrete time signals, evaluate their energy and power, check for periodicity and evaluate the period of a signal.	PSO - 2	C
CO - 2	Identify properties of discrete time systems. (stability, causality, invertibility)	PSO - 3	Ap
CO - 3	Evaluate discrete-time Fourier transform. (DTFT) of a sequence	PSO - 6	E
CO - 4	Compute the linear and circular convolution of discrete-time sequences.	PSO - 4	E
CO - 5	Estimate the z-transform of a sequence, identify its region of convergence and compute the inverse Z- transform.	PSO - 1	E
CO - 6	Evaluate the discrete Fourier transform (DFT) of a sequence, relate it to the DTFT and use the DFT to compute the linear convolution of two sequences.	PSO - 5	E
CO - 7	Explain the various filters.	PSO - 2	U
CO - 8	Infer various structures of Digital filters.	PSO - 7	U

Semester   **: V &VI**   **Physics Lab-V**

Name of the Course   **: Non-Electronics Practical**

Course code   **: PC17P5**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Demonstrate the experimental techniques and develop competence in handling optical instruments.	PSO - 1	U
CO - 2	Demonstrate an understanding of the scientific method and apply it in practice. (a familiarity with optics).	PSO - 3	U/An
CO - 3	Analyse the diffraction and dispersion phenomena in optical elements (grating or prism) using spectrometer.	PSO - 4	An
CO - 4	Measure the various optical parameters (focal length, dispersive power, refractive index, radius of curvature, minimum deviation etc) using optical elements. (prism and grating).	PSO – 5,7	E
CO - 5	Develop practical hands-on experience applying widely used techniques to investigate optical phenomena. (oblique incidence, Normal Incidence, i – d curve, Hyperbolic fringes and Elliptical fringes)	PSO - 2	Ap
CO - 6	Record, analyze, interpret and critically evaluate Cauchy's constant and Hartmann's interpolation formula experimentally.	PSO - 6	C

Semester   **: V & VI**   **Physics Lab-VI**

Name of the Course   **: Electronics Practical**

Course code   **: PC17P6**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Develop knowledge and skills relating to electricity and electronics through hands-on learning experience.	PSO - 4	Ap
CO - 2	Understand the fundamental concepts and mechanisms used in Digital Electronics. (Logic gates and Flip – Flops)	PSO - 2	U
CO - 3	Design and analyse digital systems / logical circuits. (De Morgans theorems using IC)	PSO - 1	An
CO - 4	Analyse and design various combinational and sequential circuits. (Flip flop, Counters, Encoder, Decoder etc.)	PSO - 5	An/E
CO - 5	Understand the operations of microprocessor 8085 using various modes.	PSO - 3	U
CO - 6	Infer the operation of basic logic gates, understand Boolean algebra and simplify simple Boolean functions by using basic Boolean properties.	PSO - 6	Ap

Semester   : **V & VI**   **Physics Lab-VII**

Name of the Course   : **Computer Practical**

Course code   : **PC17P7**

CO	Upon completion of this course, students will be able to:	PSO addressed	CL
CO - 1	Understand the principles of object oriented program to construct computer programs and modeling of experimental data for the solution of problems in physics. (period of a pendulum and Young's modulus of a material).	PSO - 1	U
CO - 2	Apply object oriented programming techniques to solve computing problems. (addition, subtraction, multiplication and division)	PSO - 3	Ap
CO - 3	Develop programs using functions and classes. (objects, array of objects, friend functions, passing and returning objects, function declaration with/without using the return statement).	PSO - 2	Ap/C
CO - 4	Formulate the applications of pointers and virtual functions. Distinguish formatted and unformatted I/O operations.	PSO - 6	E
CO - 5	Develop programs using constructor, destructor, operator overloading and inheritance. (generate a series of Fibonacci numbers using constructor in the scope of class definition / out of the class definition using the scope resolution operator).	PSO - 4	C
CO - 6	Analyze the concepts trained in the computer lab activities and provide an understanding of data acquisition and analysis.	PSO - 5	An