ST JOSEPH'S COLLEGE FOR WOMEN

PHYSICS DEPARTMENT

Course out comes (Cos)

Semester	Course code	Course name	Course out comes (Cos)
Sem I	23C1113A	COURSE 1: Essentials and Applications of Mathematical, Physical And Chemical Sciences	(Co2)To Explain the basic principles and concepts underlying a broad range of fundamental areas of physics and to Connect their knowledge of physics to everyday situations
			(Co4)Understand the interplay and connections between mathematics, physics, and chemistry in various applications. Recognize how mathematical models and physical and chemical principles can be used to explain and predict phenomena in different contexts.

ST JOSEPH'S COLLEGE FOR WOMEN

PHYSICS DEPARTMENT

Course out comes (Cos)

Semester	Course code	Course name	Course out comes (Cos)
Sem I	23C1113B	COURSE 2: Advances in Mathematical, Physical and Chemical Sciences	To Explain the basic principles and concepts underlying a broad range of fundamental areas of physics and to Connect their knowledge of physics to everyday situations.
			Understand the different sources of renewable energy and their generation processes and advances in nanomaterials and their properties, with a focus on quantum dots. To study the emerging field of quantum communication and its potential applications. To gain an understanding of the principles of biophysics in studying biological systems. Explore the properties and applications of shape memory materials.
			Understand the interplay and connections between mathematics, physics, and chemistry in various advanced applications. Recognize how mathematical models and physical and chemical principles can be used to explain and predict phenomena in different contexts.

ST JOSEPH'S COLLEGE FOR WOMEN

PHYSICS DEPARTMENT

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Semester	Course code	Course name	Course out comes (Cos)
Sem II		COURSE 3: Mechanics, Properties of Matter	(Co1) Students will be able to understand and apply the concepts of scalar and vector fields, calculate the gradient of a scalar field, determine the divergence and curl of a vector field.
			(Co2) Understand Newton's laws of motion and motion of variable mass system and its application to rocket motion and the concepts of impact parameter, scattering cross section
			(Co3)Apply the rotational kinematic relations, the principle and working of gyroscope and it applications and the precessional motion of a freely rotating symmetric top
			(Co4) Comprehend the general characteristics of central forces and the application of Kepler's laws to describe the motion of planets and satellite in circular orbit through the study of law of Gravitation
			(CO5)Understand postulates of Special theory of relativity and its consequences such as length contraction, time dilation, relativistic mass and mass-energy equivalence
Sem-II		COURSE 3: Practical- Mechanics, Properties of Matter	Perform experiments on Properties of matter such as the determination of module of elasticity viz., Young's modulus, Rigidity modulus of certain materials; Surface tension of water , Coefficient of viscosity of a liquid , Moment of inertia of some regular bodies by different methods and compare the experimental values with the standard values.

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PHYSICS DEPARTMENT

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Semester	Course code	Course name	Course out comes (Cos)
Sem II			
			(Co2)The distinction between un damped, damped and forced oscillations and the concepts of resonance and quality factor with reference to damped harmonic oscillator.
			(Co3)To utilize mathematical relationships related to wave characteristics
			(Co4): Figure out the formation of harmonics and overtones in a stretched string
			(Co5)acquire the knowledge on Ultrasonic waves, their production and detection and their applications in different fields
Sem-II		COURSE 4: practical Waves and Oscillations	Perform experiments on Properties of matter such as the determination of module of elasticity *viz.*, Young's modulus, Rigidity modulus of certain materials; Surface tension of water , Coefficient of viscosity of a liquid , Moment of inertia of some regular bodies by different methods and compare the experimental values with the standard values. Know how to determine the acceleration due to gravity at a place using Compound pendulum and Simple pendulum Notice the difference between flat resonance and sharp resonance in case of volume resonator and sonometer experiments respectively Verify the laws of transverse vibrations in a stretched string using sonometer and comment on the relation between frequency, length and tension of a stretched string under vibration Demonstrate the formation of stationary waves on a string in Melde's stringexperiment

ST JOSEPH'S COLLEGE FOR WOMEN

PHYSICS DEPARTMENT

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Semester	Course code	Course name	Course out comes (Cos)
Sem III	20C3307	PHYSICS-3- Heat & Thermodynamics	**(Co1)**Understand the basic aspects of kinetic theory of gases, Maxwell-Boltzman distribution law, equipartition of energies, mean free path of molecular collisions and the transport phenomenon in ideal gases
			(Co2) Gain knowledge on the basic concepts of thermodynamics, the first and the second law of thermodynamics, the basic principles of refrigeration,the concept of entropy,the thermodynamic potentials and their physical interpretations
			(CO3) Understand the working of Carnot's ideal heat engine, Carnot cycle and its efficiency Develop critical understanding of concept of Thermodynamic potentials,the formulation of Maxwell's equations and its applications
			(Co4) Differentiate between principles and methods to produce low temperature and liquefy air and also understand the practical applications of substances at low temperatures
			(CO5) Examine the nature of black body radiations and the basic theories
Sem-III Practical paper--3	20C3307P	PHYSICS Practical-3 Heat & Thermodynamics	Perform some basic experiments in thermal Physics, viz., determinations of Stefan's constant, coefficient of thermal conductivity, variation of thermo- e m f of a thermocouple with temperature difference at its two junctions, calibration of a thermocouple and Specific heat of a liquid

ST JOSEPH'S COLLEGE FOR WOMEN

PHYSICS DEPARTMENT

Course out comes (Cos)

Semester	Course code	Course name	Course out comes (Cos)
Sem IV Paper-4	20C4307-A	PHYSICS-4- Electricity Magnetism & Electronics	(Co1)Understand the Gauss law and its application to obtain electric field in different cases and formulate the relationship between electric displacement vector, electric polarization, Susceptibility, Permittivity and Dielectric constant. Distinguish between the magnetic effect of electric current and electromagnetic induction and apply the related laws in appropriate circumstances
			(Co2) understand Biot and Savart's law and Ampere's circuital law to describe and explain the generation of magnetic fields by electrical currents. develop an understanding on the unification of electric and magnetic fields and Maxwell's equations governing electromagnetic waves
			(Co3)phenomenon of resonance in LCR AC-circuits, sharpness of resonance, Q-factor ,Power factor and the comparative study of series and parallel resonant circuits
			(Co4)Describe the operation of p-n junction diodes, zener diodes, light emitting diodes and transistors
			(Co5)understand the operation of basic logic gates and universal gates and their truth tables
Sem-IV Paper-4 Practical-4	20C4307AP	PHYSICS Practical-4 Electricity Magnetism & Electronics	Measure the current sensitivity and figure of merit of a moving coil galvanometer. Observe the resonance condition in LCR series and parallel circuit Learn how a sonometer can be used to determine the frequency of AC-supply. Understand the operation of PN junction diode, Zener diode and a transistor and their V-I characteristics. Construct the basic logic gates, half adder and full adder and verify their truth tables. Further, the student will understand how NAND and NOR gates can be used as universal. building blocks

ST JOSEPH'S COLLEGE FOR WOMEN

PHYSICS DEPARTMENT

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Semester	Course code	Course name	Course out comes (Cos)
Sem IV Paper-5	20C4307-B	PHYSICS--5- Modern Physics	Co1)Develop an understanding on the concepts of Atomic and Modern Physics, basic elementary quantum mechanics and nuclear physics
			(Co2)develop critical understanding of concept of Matter waves and Uncertainty principle
			(Co3)Get familiarized with the principles of quantum mechanics and the formulation of Schrodinger wave equation and its applications
			(Co4)examine the basic properties of nuclei, characteristics of Nuclear forces, salient features of Nuclear models and different nuclear radiation detectors. Classify Elementary particles based on their mass, charge, spin, half life and interaction.
			(Co5)get familiarized with the nano materials, their unique properties and applications. (Co6)Increase the awareness and appreciation of superconductors and their practical applications
Sem-IV Paper-5 Practical-5	20C4307-BP	PHYSICS Practical-5 Modern Physics	Measure charge of an electron and e/m value of an electron by Thomson method. Understand how the Planck's constant can be determined using Photocell and LEDs. Study the absorption of α-rays and β-rays, Range of β-particles and the characteristics of GM counter Determine the Energy gap of a semiconductor using thermistor and junction diode

ST JOSEPH'S COLLEGE FOR WOMEN

PHYSICS DEPARTMENT

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Semester	Course code	Course name	Course out comes (Cos)
Sem V Paper-6C	20C53076-C	PHYSICS-6C Applications of Electricity &Electronics	(Co1) .Identify various components present in Electricity& Electronics Laboratory
			(Co2) .Acquire a critical knowledge of each component and its utility (like resistors, capacitors, inductors, power sources etc.).
			(Co3). Demonstrate skills of constructing simple electronic circuits consisting of basic circuit elements
			(Co4). Understand the need & Functionality of various DC & AC Power sources
			(Co5).Comprehend the design, applications and practices of various electrical & Electronic devices and also their trouble shooting
Sem-V Paper-6C Practical	20C53076-CP	PHYSICS Practical-6C Applications of Electricity &Electronics	1 .List out, identify and handle various equipment in Electrical & Electronics laboratory. 2. Learn the procedures of designing simple electrical circuits. 3. Demonstrate skills on the utility of different electrical components and devices. 4.Acquire the skills regarding the operation, maintenance and troubleshooting of various Devices in the lab. 5.Understand the different applications of Electromagnetic induction

ST JOSEPH'S COLLEGE FOR WOMEN

PHYSICS DEPARTMENT

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Semester	Course code	Course name	Course out comes (Cos)
Sem V Paper -7C	20C53077-C	PHYSICS-7C- Electronic Instrumentation	(Co1). Identify various facilities required to set up a basic Instrumentation Laboratory
			(Co2). Acquire a critical knowledge of various Electrical Instruments used in the Laboratory
			(Co3). Demonstrate skills of using instruments like CRO, Function Generator, Multimeter etc. through hands on experience
			(Co4). Understand the Principle and operation of different display devices used in the display systems and different transducers
			(Co5). Comprehend the applications of various biomedical instruments in daily life like B.P. meter, ECG, Pulse oxymeter etc. and know the handling procedures with safety and security
Sem-V Practical Paper -7C	20C53077-CP	PHYSICS Practical-7C Electronic Instrumentation	1. List out, identify and handle various equipment in Instrumentation Laboratory or Electronic Laboratory. 2. Learn the construction, operational principles of various instruments. 3. Demonstrate skills on handling, Maintenance & trouble shooting of different instruments used in the Labs. 4. Acquire skills in observing and measuring various electrical and electronic quantities. 5. Perform some techniques related to Biomedical Instrumentation and measurement of Certain physiological parameters like body temperature, B.P. and sugar levels etc.