

SIR C R REDDY COLLEGE FOR WOMEN

PHYSICS COURSE OUTCOMES (COS)

Course Code : PHYSICS

Course Name: Mechanics, Waves & Oscillations

Upon completion of this course, the student will be able to	
CO1	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.
CO2	Apply the rotational kinematic relations, the principle and working of gyroscope and its applications and the precessional motion of a freely rotating symmetric top.
CO3	Comprehend the general characteristics of central forces and the application of Kepler's laws to describe the motion of planets and satellites in circular orbit through the study of the law of Gravitation.
CO4	Understand postulates of Special theory of relativity and its consequences such as length contraction, time dilation, relativistic mass and mass-energy equivalence.
CO5	Examine phenomena of simple harmonic motion and the distinction between undamped, damped and forced oscillations and the concepts of resonance and quality factor with reference to damped harmonic oscillator.
CO6	Appreciate the formulation of the problem of coupled oscillations and solve them to obtain normal modes of oscillation and their frequencies in simple mechanical systems.
CO7	Figure out the formation of harmonics and overtones in a stretched string and acquire the knowledge on Ultrasonic waves, their production and detection and their applications in different fields.
CO8	Perform experiments on Properties of matter such as the determination of Coefficient of viscosity of a liquid by Poiseuille's method, Moment of inertia of some regular bodies by different methods and compare the experimental values with the standard values.
CO9	Know how to determine the acceleration due to gravity at a given place using Simple pendulum.
CO10	Perform an experiment to determine the frequency of unknown tuning fork using a volume resonator experiment.
CO11	Know how to determine the force constant of spring by static and dynamic method.

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Course Code : PHYSICS

Course Name: Wave Optics

Upon completion of this course, the student will be able to:	
CO 1	Understand the phenomenon of interference of light and its formation in (i) Lloyd's single mirror due to division of wave front and (ii) Thin films, Newton's rings, Michelson interferometer due to division of amplitude.
CO 2	Distinguish between Fresnel's diffraction and Fraunhofer diffraction and observe the diffraction patterns in the case of single slit and the diffraction grating.
CO 3	Describe the construction and working of zone plate and make the comparison of zone plate with convex lens.
CO 4	Explain the various methods of production of plane, circularly and polarized light and their detection and the concept of optical activity..
CO 5	Comprehend the basic principle of laser, the working of He-Ne laser and Ruby lasers and their applications in different fields.
CO 6	Explain about the different aberrations in lenses and discuss the methods of minimizing them.
CO 7	Understand the basic principles of fibre optic communication and explore the field of Holography and Nonlinear optics and their applications.
CO 8	Gain hands-on experience of using various optical instruments like spectrometer, polarimeter and making finer measurements of wavelength of light using Newton Rings experiment, diffraction grating etc.
CO 9	Understand the principle of working of polarimeter and the measurement of specific rotatory power of sugar solution
CO 10	Know the techniques involved in measuring the resolving power of telescope and dispersive power of the material of the prism.
CO 11	Be familiar with the determination of refractive index of liquid by Boy's method and the determination of thickness of a thin wire by wedge method.

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Course Code : PHYSICS

Course Name: Heat & Thermodynamics

Upon completion of this course, the student will be able to	
CO1	Understand the basic aspects of kinetic theory of gases, Maxwell-Boltzmann 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
CO4	Develop critical understanding of concept of Thermodynamic potentials, the formulation of Maxwell's equations and its applications.
CO5	Differentiate between principles and methods to produce low temperature and liquefy air and also understand the practical applications of substances at low temperatures.
CO6	Examine the nature of black body radiation and the basic theories.
CO7	Perform some basic experiments in thermal Physics, viz., determinations of coefficient of thermal conductivity of rubber and bad conductor, Joule's calorimeter and Newton's law of cooling to determine the specific heat of a liquid, Heating efficiency of electric kettle, Study of variation of resistance with temperature by thermistor.

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Course Code : PHYSICS

Course Name: Electricity, Magnetism & Electronics

Upon completion of this course, the student will be able to:	
CO-1	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.
CO-2	Distinguish between the magnetic effect of electric current and electromagnetic induction and apply the related laws in appropriate circumstances.
CO-3	Understand Biot and Savart's law and Ampere's circuital law to describe and explain the generation of magnetic fields by electrical currents.
CO-4	Develop an understanding on the unification of electric and magnetic fields and Maxwell's equations governing electromagnetic waves.
CO-5	Phenomenon of resonance in LCR AC-circuits, sharpness of resonance, Q-factor, Power factor and the comparative study of series and parallel resonant circuits.
CO-6	Describe the operation of p-n junction diodes, zener diodes, light emitting diodes and transistors
CO-7	Understand the operation of basic logic gates and universal gates and their truth tables
CO-8	Observe the resonance condition in LCR series and parallel circuit
CO-9	Learn how a sonometer can be used to determine the frequency of AC-supply.
CO-10	Understand the operation of PN junction diode, Zener diode and a transistor and their V-I characteristics.
CO-11	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

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Course Code : PHYSICS

Course Name: Modern Physics (4B)

Upon completion of this course, the student will be able to:	
CO 1	Develop an understanding on the concepts of Atomic and Modern Physics, basic elementary quantum mechanics and nuclear physics.
CO 2	Develop critical understanding of concept of Matter waves and Uncertainty principle.
CO 3	Get familiarized with the principles of quantum mechanics and the formulation of Schrodinger wave equation and its applications.
CO 4	Examine the basic properties of nuclei, characteristics of Nuclear forces, salient features of Nuclear models and different nuclear radiation detectors.
CO 5	Classify Elementary particles based on their mass, charge, spin, half life and interaction.
CO 6	Get familiarized with the nano materials, their unique properties and applications.
CO 7	Increase the awareness and appreciation of superconductors and their practical applications
CO 8	Measure charge of an electron and e/m value of an electron by Thomson method.
CO 9	Understand how the Planck's constant can be determined using Photocell and LEDs.
CO 10	Determination of M & H by Vibration magnetometer, Deflection magnetometer.
CO 11	Determine the Energy gap of a semiconductor using thermistor and junction diode.

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Course Code : PHYSICS 6B

Course Name: LOW TEMPERATURE PHYSICS AND REFRIGERATION

Upon completion of this course, the student will be able to:	
CO 1	Identify various methods and techniques used to produce low temperatures in the Laboratory.
CO 2	Acquire critical knowledge on refrigeration and air conditioning.
CO 3	Demonstrate skills of Refrigerators through hands-on experience and learn about refrigeration components and their accessories.
CO 4	Understand the classification, properties of refrigerants and their effects on the environment.
CO 5	Comprehend the applications of Low Temperature Physics and refrigeration.

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Course Code : PHYSICS 7B

Course Name: SOLAR ENERGY AND APPLICATIONS

Upon completion of this course, the student will be able to:	
CO-1	Understand Sun structure, forms of energy coming from the Sun and its measurement.
CO-2	Acquire a critical knowledge on the working of thermal and photovoltaic collectors.
CO-3	Demonstrate skills related to callus culture through hands on experience
CO-4	Understand testing procedures and fault analysis of thermal collectors and PV modules.
CO-5	Comprehend applications of thermal collectors and PV modules.