

Co-PO-PSO Mapping

Physics


CO-PO-PSO Mapping for B.Sc. Physics Syllabus

Course Name	COs	CO Description	PO							PSO						
			1	2	3	4	5	6	Average	1	2	3	4	5	Average	
Semester I																
Mathematical Physics - I (UGPHYCC01)	CO1	Understand and apply elementary calculus, limits & continuity, plotting functions, Taylor & binomial series to analyze physical problems.	0	3	3	3	0	0	2.77	0	3	0	0	0	3.00	
	CO2	Simplify & formulate physical problems in differential equations and solve.	0	0	0	3	0	0		0	3	3	0	0		
	CO3	Remember vector identities and solve associated problems.	1	0	0	3	0	0		3	0	0	0	0		
	CO4	Understand the necessity of orthogonal coordinate systems, probability theory and Dirac delta function.	0	0	0	0	3	0		0	3	0	0	0		
	CO5	Analyze and construct computer programming to solve problems.	0	0	0	3	0	3		0	0	0	0	3		
Mechanics (UGPHYCC02)	CO1	Remember laws of motion and understand various types of motions (eg. SHM).	3	0	0	0	0	0	3.00	3	0	0	0	0	3.00	
	CO2	Understand and analyze the phenomena of collisions and idea about centre of mass and laboratory frames and their correlation	0	3	0	0	0	0		0	3	0	0	0		
	CO3	Understand the principles of elasticity and compare material based on elastic modulus.	0	0	0	3	0	0		0	0	0	3	0		
	CO4	Apply Kepler's law to describe the motion of planets and satellite.	0	0	3	0	0	0		0	0	3	0	0		
	CO5	Understand basics of special theory of relativity.	0	3	0	0	0	0		3	3	0	0	0		
	CO6	Construct simple experimental set-ups to acquire better understanding about the course as well as to develop skill.	0	0	0	3	3	3		0	0	0	3	0		
Mechanics (UGPHYGE01)	CO1	Understand to apply basic mathematical tools to solve mechanical systems.	0	3	3	0	0	0	2.90	3	3	0	0	0	2.90	
	CO2	Remember laws of motion and understand various types of motions.	0	3	0	0	0	0		3	0	0	0	0		
	CO3	Understand the principles of elasticity and compare material based of elastic modulus.	0	0	3	3	0	0		0	0	3	3	0		0
	CO4	Apply Kepler's law to describe the motion of planets and satellite in circular orbit, through the study of law of Gravitation	0	0	3	0	3	0		0	0	3	0	0		3
	CO5	Understand basics of special theory of relativity	0	3	0	0	2	0		0	0	3	2	0		0
	CO6	Construct simple experimental set-ups to acquire better understanding about the course as well as to develop skill.	0	0	0	3	3	3		0	0	0	3	3		
	CO1	Engage in self-directed English language learning.	3	3	2	0	0	0		3	0	0	0	0		


Principal

Ramakrishna Mission
Vivekananda Centenary College
Rahara, Kolkata - 700 118

Course Name	COs	CO Description	PO						PSO						
			1	2	3	4	5	6	Average	1	2	3	4	5	Average
English Communication (UGPHYAEC01)	C02	Be responsible and ethical English users.	3	3	3	0	0	0	2.90	3	3	0	0	0	3.00
	C03	Enhance their English language proficiency in the aspects of reading, writing, listening and speaking.	3	3	3	0	0	0		3	3	0	0	0	
	C04	Develop academic literacy required for undergraduate learning, further studies and research.	0	0	3	3	0	0		0	3	0	3	0	
	C05	Apply the requisite communicative skills and strategies to future careers.	0	0	3	0	3	0		0	0	3	0	3	
	C06	Gain an insight into cultural literacy and cross-cultural awareness.	0	0	3	0	3	0		0	0	3	0	0	
Semester II															
Electricity and Magnetism (UGPHYCC03)	C01	Remember and understands fundamental laws of electrodynamics	3	3	0	0	0	0	2.87	3	0	0	0	0	2.85
	C02	Understand complex reactance & impedance in AC circuits.	0	3	3	2	0	0		0	3	2	0	0	
	C03	Apply laws of electricity and magnetism to evaluate electro-magnetic fields for charges and currents.	0	0	0	3	0	3		0	0	3	3	0	
	C04	Simplify complicated networks through network theorems. Construct DC circuits for better understanding.	0	0	0	3	0	0		0	0	0	3	3	
Waves and Optics (UGPHYCC04)	C01	Understand oscillatory motions. Solve differential equations of free, damped and forced oscillations.	0	3	0	0	0	0	2.90	3	0	0	0	0	2.87
	C02	Remember and understand the acoustical terms like sound intensity, loudness, intensity level, Bel, decibel, phon.	3	0	3	0	0	0		3	0	0	0	0	
	C03	Analyze vibration of stretched string to determine formation of different tones.	0	0	0	3	3	0		0	0	3	0	0	
	C04	Remember and understand basic principles of light propagation. Understand interference, diffraction.	3	3	0	2	0	0		3	3	2	0	0	
	C05	Estimate the chemical nature of the source from spectrum analysis.	0	0	0	3	0	3		0	0	0	3	3	
Thermal Physics and Statistical Mechanics (UGPHYGE02)	C01	Remember and understand laws of thermodynamics	0	3	0	0	0	0	2.88	3	0	0	0	0	2.80
	C02	Understand the interrelationship between thermodynamic potentials and use these relationships to solve practical problems.	0	0	3	0	0	0		0	3	0	3	0	
	C03	Understand basic ideas of kinetic theory of gas, Maxwell-Boltzmann's law of velocity distribution and transport properties.	0	0	3	2	0	0		0	0	2	2	0	
	C04	Understand the formulation of statistical mechanics and its application to macroscopic systems.	0	0	3	3	3	0		0	0	3	3	3	
	C05	Construct simple experimental set-ups to validate theoretical aspects.	0	0	0	3	0	3		0	0	0	3	3	


 Principal
 Ramakrishna Mission
 Vivekananda Centenary College
 Rahara, Kolkata - 700 118

Course Name	COs	CO Description	PO							PSO					
			1	2	3	4	5	6	Average	1	2	3	4	5	Average
Environmental Science (UGPHYAEC02)	C01	Define and demonstrate the concept, components and function of natural resources and ecosystems.	3	0	0	0	0	0	3.00	0	0	2	0	0	2.66
	C02	Define, illustrate and analyze the cause, effects and control measures of various environmental pollutants.	0	0	3	0	0	0		0	0	3	0	0	
	C03	Demonstrate the basic idea about the disasters and its management.	0	0	3	0	0	0		0	0	2	0	0	
	C04	Illustrate and apply the knowledge about the social, environmental issues and environmental legislation.	0	0	0	3	0	0		0	0	3	0	0	
	C05	Define, demonstrate and evaluate the impact of human population on the Environment	0	0	0	0	0	3		0	0	3	0	3	
Semester III															
Mathematical Physics - II (UGPHYCC05)	C01	Understand Fourier series and Fourier transform. Apply to analyze various periodic & non-periodic functions.	0	3	0	0	0	3	2.90	0	3	3	0	3	2.90
	C02	Understand the technique of series solution of 2nd order linear differential equations. Solve partial differential equations by the method of separation of variables.	0	0	3	0	3	3		0	3	0	0	3	
	C03	Understand special mathematical functions and orthogonal polynomials.	0	3	0	0	2	0		0	3	2	0	0	
	C04	Understand the basic ideas of variational calculus. Apply in simple problems.	0	0	3	0	3	0		0	3	3	0	3	
	C05	Construct numerical programming to solve differential equations.	0	0	0	3	0	3		0	0	0	0	3	
Thermal Physics (UGPHYCC06)	C01	Remember and understand laws of thermodynamics	3	3	0	0	0	0	3.00	3	0	0	0	0	2.83
	C02	Understand the interrelationship between thermodynamic functions and able to use these relationships to solve practical problems.	0	3	3	0	0	0		0	3	0	0	0	
	C03	Understand basic ideas of kinetic theory of gas, Maxwell-Boltzmann law of velocity distribution and transport properties.	0	3	0	0	0	0		0	0	0	0	2	
	C04	Understand real gas behaviour and apply equation of states to determine critical constants.	0	0	3	0	3	0		0	3	0	0	3	
	C05	Construct simple experimental set-ups to validate theoretical aspects.	0	0	0	3	0	3		0	0	0	3	0	
Digital Systems	C01	Remember and understand Boolean logic and its connection to digital electronics.	3	3	0	0	0	0		3	0	0	0	0	
	C02	Understand basics of number system and their arithmetic operations	0	3	0	0	2	0		3	0	2	0	0	


 Principal
 Ramakrishna Mission
 Vivekananda Centenary College
 Rahara, Kolkata - 700 118

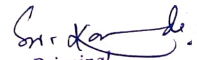
Course Name	COs	CO Description	PO							PSO						
			1	2	3	4	5	6	Average	1	2	3	4	5	Average	
Digital Systems and Applications (UGPHYCC07)	C03	Synthesize Boolean functions, simplify digital circuits by employing Boolean algebra.	0	0	0	3	0	3	2.80	0	0	3	3	0	2.77	
	C04	Understand operation of sequential and combinational circuits to construct simple devices.	0	0	0	3	0	3		0	0	3	3	0		
	C05	Understand fundamentals of basic computer architecture.	0	3	0	0	2	0		3	0	0	0	2		
Value Education and Indian Culture (UGPHYSEC01)	C01	Define, understand and apply the daily routine, self evaluation & Integral Personality Development	3	0	0	0	0	0	3.00	0	3	0	0	0	3.00	
	C02	Learn, and apply the Power of thoughts & the Science of Peace	0	0	3	0	0	0		0	3	3	0	0		
	C03	Understand the relation: Values and enlightened citizenship	0	3	0	0	0	0		0	3	0	0	0		
	C04	Discuss the awareness about the Indian Practice and Culture	0	0	0	3	0	0		0	0	3	0	0		
	C05	Demonstrate and practice the Four Yogas	0	0	0	0	0	3		0	0	3	0	0		
	C06	Explain and analyze the idea about Modern India: her hopes, challenges and Swami Vivekananda	0	0	0	0	0	3		0	3	3	0	0		
Waves and Optics (UGPHYGE03)	C01	Understand oscillatory motions. Solve differential equations of free, damped and forced oscillations.	0	3	3	0	3	0	2.72	0	3	0	3	3	2.80	
	C02	Remember and understand the acoustical terms like sound intensity, loudness, intensity level, Bel, decibel, phon.	0	3	3	0	2	0		3	0	2	0	0		
	C03	Remember and understand basic principles of light propagation. Understand interference, diffraction.	0	0	0	2	0	2		3	0	0	2	0		
	C04	Determine wavelength of light, dispersive power of prism and frequencies of string vibration through experiments.	0	0	0	3	3	3		0	0	3	3	3		
Semester IV																
Mathematical Physics - III (UGPHYCC08)	C01	Understand and apply theory of complex variables to solve physical problems.	0	3	0	0	3	0	3.00	0	3	0	0	3	3.00	
	C02	Understand Fourier transform and analyze various functions	0	0	3	0	0	0		0	3	3	0	0		
	C03	Apply matrix algebra to solve linear systems.	0	0	0	0	3	3		0	0	3	0	3		
	C04	Write down computer programs to solve physical problems.	0	0	0	3	3	3		0	0	3	0	3		
Elements of	C01	Understand the inadequacies of classical mechanics and appreciate the historical development of quantum mechanics and its applicability.	0	0	3	0	3	0	0	3	3	0	0	0	0	
	C02	Apply Schrödinger equation to analyze time dependent and time independent quantum mechanical problems	0	3	0	3	0	0		0	3	0	0	3		

Course Name	COs	CO Description	PO							PSO					
			1	2	3	4	5	6	Average	1	2	3	4	5	Average
Modern Physics (UGPHYCC09)	C03	Remember and understand nuclear properties (eg. nuclear structure, radioactivity, fission, fusion etc.)	0	3	0	0	2	0	2.9	3	0	0	0	0	3.0
	C04	Understand basics of laser theory and apply laser techniques as experimental device.	0	0	3	0	3	3		0	0	3	3	0	
	C05	Understand quantum mechanical tunnelling and determine fundamental constants through experiments.	0	0	0	3	3	0		0	3	0	3	0	
Analog Systems and Applications (UGPHYCC10)	C01	Understand working mechanism of various semiconductor devices like diodes, solar cell, rectifier, transistors etc.	0	3	0	0	2	2	2.75	3	3	0	0	0	3.00
	C02	Evaluate transistor parameters and employ it as amplifier stage in analog circuits.	0	0	0	3	0	0		0	0	3	3	0	
	C03	Understand the working of OP-AMP and its versatile applications.	0	0	3	0	3	0		0	0	3	3	0	
	C04	Understand the working principle of oscillator and apply the knowledge to design oscillator circuit of specific frequencies.	0	0	0	3	0	3		0	0	0	3	0	
Electricity and Magnetism (UGPHYGE04)	C01	Remember and understands fundamental laws of electrodynamics	0	3	0	0	0	0	2.90	3	0	0	0	0	2.90
	C02	Apply laws of electricity and magnetism to evaluate electro-magnetic fields for charges and currents.	0	0	3	3	3	0		0	3	3	3	0	
	C03	Understand the self and mutual inductance.	0	3	0	2	0	0		0	3	0	2	0	
	C04	Understand the Maxwell's equations and apply Maxwell's equations to deduce EM wave equation, electromagnetic field energy and field momentum.	0	0	3	0	3	3		0	0	3	3	3	
	C05	Perform several experiments related to the course for better understanding and developing skill.	0	0	0	3	0	3		0	0	0	3	3	
Semester V															
Quantum Mechanics and Applications (UGPHYCC11)	C01	Understand Schrödinger equation and dynamical evolution of quantum states, acceptability & interpretation of wave function, operators, eigen values, eigen functions.	0	3	0	0	2	0	2.92	3	3	0	0	0	3.00
	C02	Gain knowledge on bound quantum systems and apply to analyse bound quantum mechanical systems like simple harmonic oscillator, hydrogen-like atoms etc.	0	0	3	3	3	0		0	3	3	0	0	
	C03	Understand and explain the vector atom model, angular momentums, concepts of space quantization etc.	0	0	3	0	0	0		3	3	0	0	0	
	C04	Explain observed dependence of atomic spectral lines on external perturbations (Zeeman effect, Paschen Back & Stark effect).	0	0	0	3	3	0		0	0	3	3	0	


Principal


Ramakrishna Mission
Vivekananda Centenary College
Rahara, Kolkata - 700 118

Course Name	COs	CO Description	PO							PSO					
			1	2	3	4	5	6	Average	1	2	3	4	5	Average
	C05	Perform experiments to observe quantum phenomena and construct specific experimental techniques to identify chemical nature of source of radiation.	0	0	0	3	3	3		0	3	0	3	0	
	C06	Estimate of magnetic field at a remote location by analyzing the spectrum of outcoming radiation.	0	0	0	3	3	3		0	0	3	3	3	
Solid State Physics (UGPHYCC12)	C01	Understand basic concept of crystal structure. Apply the ideas to analyze crystal structure of unknown sample.	0	0	3	3	0	3	2.81	0	3	0	3	0	2.81
	C02	Understand elementary lattice vibrations, phonons, specific heat of solids, dielectric properties of materials etc.	0	3	0	0	2	0		3	0	0	0	2	
	C03	Understand energy band formation in solids and analyze materials as metal, insulator and semiconductors based on band structure.	0	0	0	3	3	0		0	3	3	0	0	
	C04	Understand magnetism in material and the superconductivity phenomena.	0	3	0	0	2	0		0	3	2	0	0	
	C05	Perform experiments to demonstrate various important phenomena and predict the crystal structure of an unknown.	0	0	0	3	0	3		0	0	3	3	3	
Advanced Mathematical Physics - I (UGPHYDSE01)	C01	Understand Laplace transformation and its application to various branches of science	0	0	3	0	0	3	2.75	0	3	3	0	0	2.83
	C02	Understand basic idea of Linear Vector Space.	0	0	3	0	0	2		0	3	0	0	2	
	C03	Understand and apply the method of coordinate transformations to nalyze physical systems through tensor algebra	0	0	3	0	3	0		0	0	3	0	0	
	C04	Understand Contravariant & Covariant vectors. Contravariant, Covariant and Mixed Tensors.	0	3	0	0	0	2		0	3	0	0	0	
Classical Dynamics (UGPHYDSE02)	C01	Understand and analyze motion of charged particle in electro-magnetic field.	0	0	3	0	3	0	2.87	0	3	0	0	3	2.87
	C02	Apply Lagrangian and Hamiltonian formulation in mechanical systems.	0	0	3	0	3	0		0	3	3	0	0	
	C03	Understand fundamentals of fluid dynamics: continuity equation, Poiseuille's equation, Navier-Stoke's equation, turbulence and perform related experiments.	0	0	0	3	3	0		0	0	0	3	3	
	C04	Understand basic ideas of special theory of relativity and associated physics.	0	3	0	0	2	0		0	3	0	0	2	
	C01	Understand the basic idea and development of electronic communication systems	0	3	0	0	2	0		0	3	2	0	0	


 Principal
 Ramakrishna Mission
 Vivekananda Centenary College
 Rahara, Kolkata - 700 118

Course Name	COs	CO Description	PO						PSO						
			1	2	3	4	5	6	Average	1	2	3	4	5	Average
Communication Electronics (UGPHYDSE03)	C02	Understand electronic signal processing: modulation and demodulation. Apply their understandings to analyze signal-to-noise ratio.	0	0	0	3	0	3	2.77	0	0	0	3	3	2.71
	C03	Gain an extended knowledge in navigation systems and have a clear idea on GPS	0	3	0	0	0	2		0	3	2	0	0	
	C04	Design few simple communication devices: modulator, demodulator etc through their laboratory works.	0	0	3	0	3	3		0	0	0	0	3	
Semester VI															
Electromagnetic Theory (UGPHYCC13)	C01	Remember and understand basic laws of electrodynamics.	0	3	0	0	0	0	3.00	3	0	0	0	0	3.00
	C02	Deduce wave equation from Maxwell's equations.	0	0	3	0	3	0		0	3	0	0	0	
	C03	Apply Maxwell's equations to understand the reflection and refraction of EM wave. Understand wave guides.	0	0	3	3	0	0		0	3	3	0	0	
	C04	Understand polarization of light. Analyze polarization states by retardation plates.	0	0	0	3	3	0		0	0	3	3	0	
	C05	Understand the phenomenon associated with EM wave through experiments and estimate concentration of optically active solutes.	0	0	3	3	0	3		0	0	3	3	0	
Statistical Mechanics (UGPHYCC14)	C01	Remember and understand laws of thermodynamics and their applications.	0	3	0	0	0	0	2.87	3	0	0	0	0	2.87
	C02	Appreciate statistical interpretation of thermodynamics, microcanonical, canonical and grand canonical ensembles.	0	0	3	0	0	2		3	0	0	0	2	
	C03	Apply the statistical approach to calculate macroscopic properties of bosonic and fermionic systems.	0	0	3	3	3	0		0	3	0	0	3	
	C04	Apply theoretical knowledge to write down computer codes to simulate and extract statistical properties of system of particles.	0	0	0	0	3	3		0	3	0	3	3	
Advanced Mathematical Physics - II (UGPHYDSE04)	C01	Understand variational calculus and its application to analyze dynamical systems	0	3	0	0	3	0	2.90	0	3	0	0	3	3.00
	C02	Know about Lagrangian and Hamiltonian and can apply to solve dynamical systems.	0	0	3	3	3	0		0	3	3	0	0	
	C03	Understand basics of Sets and Group theory. Understand classifications of groups.	0	3	0	0	2	0		0	3	0	0	0	
	C04	Acquire detail understanding on the theory of probability and various probabilistic distribution functions. Perform computer simulations.	0	0	0	3	3	3		0	0	3	0	3	

Course Name	COs	CO Description	PO							PSO					
			1	2	3	4	5	6	Average	1	2	3	4	5	Average
Nuclear and Particle Physics (UGPHYDSE05)	C01	Gain in-depth and up-to date information about nuclear and particle physics.	0	3	0	0	0	0	2.90	3	0	0	0	0	3.00
	C02	Understand the notions of nuclear models and application of these models to explain nuclear phenomenon.	0	0	3	3	3	0		0	3	3	0	3	
	C03	Understand radioactivity: α , β and γ -decay. Application of radioactivity in various branches (e.g., nuclear medicine, carbon dating etc.)	0	0	3	0	3	3		0	3	3	0	3	
	C04	Understand nuclear reaction mechanisms, interaction of nuclear particles and radiation with matter, nuclear detector mechanism.	0	0	0	3	0	3		0	0	3	3	0	
	C05	Have an idea about fundamental particles and particle accelerator.	3	0	0	0	2	0		3	0	0	0	0	
Nano Materials and Applications (UGPHYDSE06)	C01	Understand the properties of materials having nano-scale dimension.	0	0	3	0	0	2	2.88	3	0	2	0	0	2.87
	C02	Have detail knowledge on device applications of nano materials (like carbon nano-tubes).	0	0	0	3	3	3		0	0	3	0	3	
	C03	Understand electron dynamics in nano dimension for further understanding of transport phenomena and optical properties.	0	0	3	0	3	0		0	0	3	0	3	
	C04	Capable of dealing with sophisticated instruments to characterize properties of nano materials.	0	0	0	3	0	3		0	0	0	3	3	
Dissertation or Project work (UGPHYDSE07)	C01	Understand the assigned problem.	0	3	3	0	0	0	3.00	3	0	0	0	0	3.00
	C02	Apply suitable method to examine the problem critically.	0	0	3	3	0	0		0	3	3	3	0	
	C03	Draw some conclusions after completion of the project work.	0	0	0	3	3	0		0	0	3	0	0	
	C04	Plan an extended version of the same problem or a similar kind of problem associated with the given problem.	0	0	0	3	3	3		0	0	0	3	3	
			Grand Average						2.89						2.90


 Principal
 Ramakrishna Mission
 Vivekananda Centenary College
 Rahara, Kolkata - 700 118