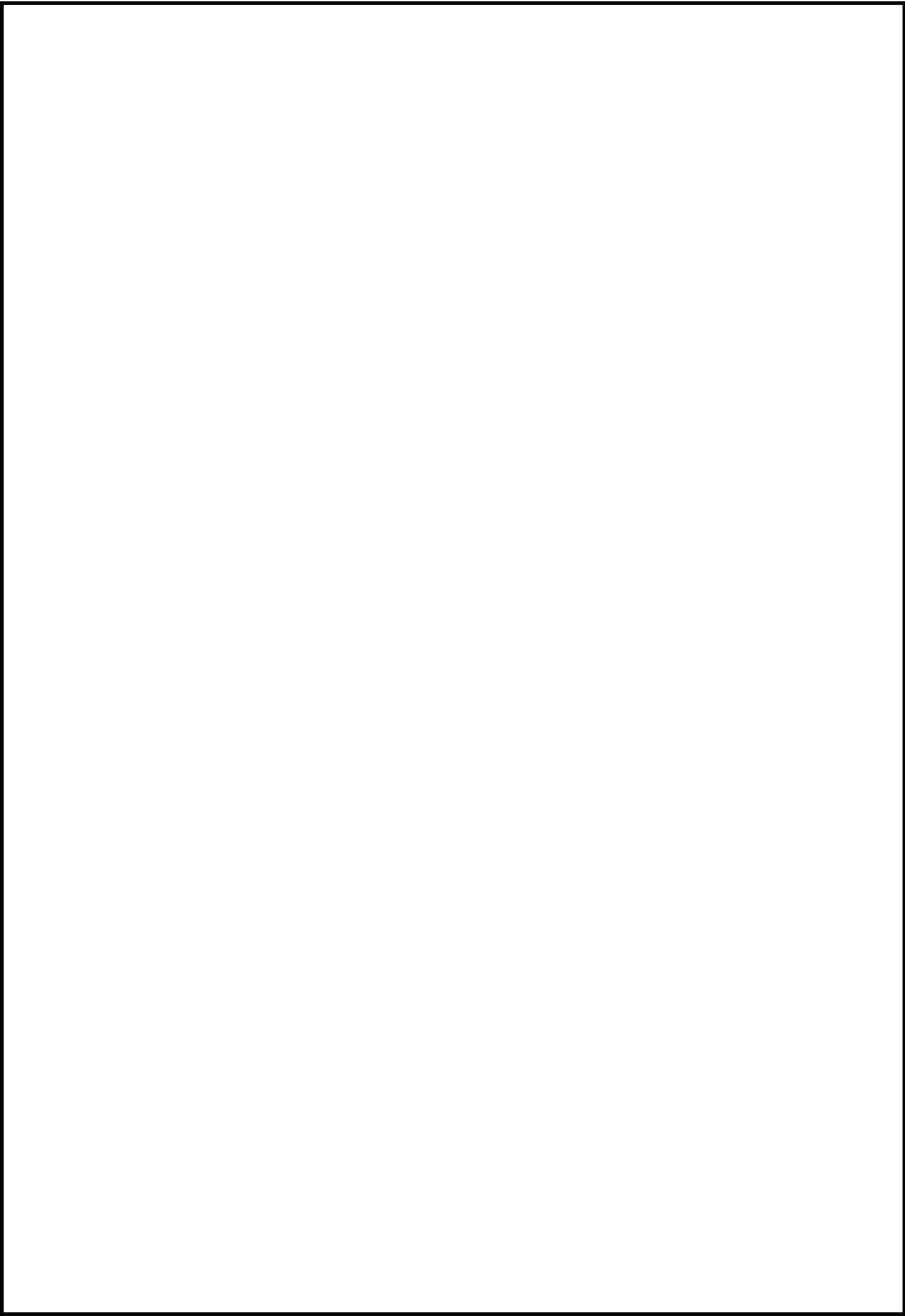


KSN Government Degree College For Women, Ananthapuram

B.Sc., PHYSICS

“The study of physics is also an adventure. You will find it challenging, sometimes frustrating, occasionally painful, and often richly rewarding.”

— **Hugh D. Young, Sears and Zemansky's University Physics**



PROGRAMME OUTCOMES (POs)

PO 1	Relevance of the Principles: To understand the basic laws of nature, fundamental principles, and the scientific theories related to various phenomena and their relevance in the day-to-day life.
PO 2	Critical Thinking, Problem Solving Skills: Acquire the skills in handling scientific instruments, planning and performing in laboratory experiments. The skills of observations and drawing logical inferences from the scientific experiments.
PO3	Interdisciplinary learning: Realizing that knowledge of subjects in other branches such as humanities, performing arts, social sciences etc. can have greater influence and inspiration in evolving new scientific theories and inventions, and understanding the importance of interdisciplinary study in every walk of life.
PO 4	Moral and Ethical Values: To imbibe ethical, moral and social values in personal and social life leading to highly cultured, civilized and responsible personality development.
PO 5	Scientific Temper: Analyzing the given scientific data critically and systematically and the ability to draw the objective conclusions. Acquire the knowledge with facts and figures related to various subjects in pure sciences such as Botany, Chemistry, Computer Science, Electronics, Mathematics, Physics, and Zoology etc.
PO 6	Technical and Intellectual proficiency: To give a glimpse of designing solutions for communication problems with specific needs with appropriate technology thus developing healthy competition and setting parameters for excellence.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

The Department of Physics, KSN Government Degree College for Women, Anantapuram, offers Three Year (comprising 6 semesters) Undergraduate Programme in Physics with objective of empowering students to acquire all-inclusive understanding of Physics as an academic discipline. Upon completion of B. Sc. Physics Degree Programme successfully, the students shall acquire the following skills and competencies.

PSO 1	To learn the basic laws of Physics and understand the various phenomenon that occur in nature using various mathematical & computational tools and theorems.
PSO 2	To perform experiments and interpret the results of observation, including making an assessment of experimental uncertainties.
PSO 3	Empowering the students with quantitative and analytic skills needed for analyzing data and solving problems of modern technology.
PSO 4	Understanding the link between various branches science and working towards the betterment of human kind and environment.
PSO 5	Using the science for living a responsible life and understanding the limitations of the various physics laws and their applications without creating chaos in nature
PSO 6	Have advanced level of understanding in various areas of Physics which is necessary in pursuing higher education in Physics.

PSO – PO MAPPING

	POs						
PSOs		1	2	3	4	5	6
	1	*					*
	2					*	*
	3		*			*	*
	4			*	*	*	
	5	*			*	*	
	6					*	*

COURSE OUTCOMES (COs)

Course Code: S1 - 291

Course Name: Mechanics & Properties of Matter

Upon completion of this course, the student will be able to:		PSO	PO
CO 1	To learn about Scalar vector fields, Curl, Divergence, gradient concepts, Line, surface and volume integrals. They would also learn about Stokes, gauss, Green's theorems and their applications.	1	1,2
CO 2	To understand the concepts of rotational kinematics of rigid body, Moment of inertia tensor, Euler equations, Precision of top, equinoxes and Gyroscope. Students would also learn about types of beams, load analysis in various configurations and mechanics of cantilever.	4	1,2,6
CO 3	To gain understanding on conservative forces, relation between conservative force and potential, equation of motion under central forces, Kepler's laws and Coriolis force.	2	1,5,6
CO 4	They would be familiarized about Galilean-Lorentz frames of references, Lorentz transformations, Michelson-Morley experiment, Postulates of special theory of relativity, length contraction, time dilation, addition of masses, Einstein's mass energy relation and 4 vector notation.	6	1,6

Course Code: S2- 292

Course Name: Waves & Oscillations

Upon completion of this course, the student will be able to:		PSO	PO
CO 1	To learn about physical properties of Simple Harmonic Motion (SHM), Torsional pendulum, Compound pendulum and their applications, Lissajous figures.	1	1,2
CO 2	To be able to solve the differential equations for forced harmonic oscillator and damped harmonic oscillator and compare the results with simple harmonic oscillator. They would also learn about Fourier series analysis of various wave forms.	2	2,5,6
CO 3	To solve the wave equation for vibrating strings and study various parameters like modes, overtones, energy transport, transverse impedance etc.	4	1,4,5
CO 4	They would also learn about basics of ultrasonics, production and detection of ultrasonics, measurement of frequency and velocity of ultrasonics and the applications of ultrasonics in today's world.	6	1,5,6

Course Code: S3-291

Course Name: OPTICS

Upon completion of this course, the student will be able to:		PSO	PO
CO 1	They would learn about various monochromatic and chromatic aberrations and their minimising techniques.	1	1,2,5
CO 2	To understand the principle of superposition, coherence, Interference by division of wavefront and amplitude, Fresnel's bi-prism, Lloyd's mirror, thin film interference, wedge shaped film interference, Newton's rings, Michelson's interferometer and their applications to sodium D lines and thickness of thin film.	2	2,4
CO 3	To understand the phenomenon of diffraction derive expression for Diffraction due to single slit, double slit and working of diffraction grating. They would also learn about resolving power of grating. They understand the concept of Fresnel's half period zones.	5	5,6
CO 4	To learn about methods of polarization, Brewster's law, Malus law, Nicol prism, Quarter wave plate, half wave plate, babinet's compensator and optical activity analysis by Laurent's half shade polarimeter. They would also learn about principles of LASER, Einstein coefficients, He-Ne laser, Ruby laser, applications of laser, Principles of optical fiber communication, classification, application. Principles of holography, limitations of Gabor's hologram and applications of holography.	6	2,4,6

Course Code: S4- 291

Course Name: Thermodynamics & Radiation Physics

Upon completion of this course, the student will be able to:		PSO	PO
CO 1	To learn about Deduction of Maxwell's distribution law of molecular speeds, Tooth wheel experiment, transport phenomena, mean free path, viscosity of gases, thermal conductivity and diffusion of gases.	2	1,2
CO 2	To learn about Isothermal and adiabatic process – reversible and irreversible processes, Carnot's engine and its efficiency Kelvin's scale, entropy, disorder, T-S diagram and other applications of entropy.	3	2,3,5
CO 3	To understand thermodynamic potentials, Maxwell equations, Clausius-Clayperon's equation, C_p/C_v , C_p-C_v for perfect gas, J-K effect, J-K coefficient for perfect and Vander wall gases.	1	1,5,6
CO 4	They learn about Joule Kelvin effect Joule Thomson cooling, liquefaction of helium, Adiabatic demagnetization, principle of refrigeration, air conditioning, effects of CFC on Ozone layer and applications of low temperature physics.	5	3,4,5
	To learn about Black Body- Planck's black body, distribution of energy in the spectrum of black body, Wein's law, Rayleigh-jeans law, Planck's theory of radiation, various types of pyrometers-experimental determination, determination of solar constant and Temperature of Sun.	6	1,3,6

Course Code: S5- 291

Course Name: Electricity, Magnetism & Electronics

Upon completion of this course, the student will be able to:		PSO	PO
CO 1	To understand the concepts of electric field and electric potential due to point charge, solid sphere, cylinder. These concepts will enhance the student towards the problems come across in the real life.	2	1,2
CO 2	To learn about the concept of capacitance, types of capacitors electrical energy storage in a capacitor and the applications of capacitors	4	2,5
CO 3	To learn about the concepts of Hall effect, using this we can find the charge particles in the given material. Also to learn about the particle accelerators like cyclotron, synchrotron and cyclo synchrotron.	3	1,5,6
CO 4	To be able to learn about Biot savart's law, Faraday's law and it's applications.	5	1,2,6
CO5	To understand the basics of the electrics, Digital electronics ,binary conversion of the number system and their applications in daily life	1	1,6

Course Code: S5- 292

Course Name: MODERN PHYSICS

Upon completion of this course, the student will be able to:		PSO	PO
CO 1	To be understand the concepts of various atomic models and their drawbacks. Stern & Gerlach experiment Vector atom model. Zeeman effect, Raman effect experimental verification applications.	5	1,3
CO 2	To learn about the concept of Matter waves and its properties, Heisenberg's uncertainty principle and experimental verification.	5	3,5
CO 3	To understand the Basic postulates of quantum mechanics, physical interpretation of wave function and Eigen functions and Eigen values.	2	2,6
CO 4	To know basic properties of nucleus, binding energy. To understand the Radioactive decay, Geiger - Nuttal law, positron emission, electron capture and neutrino hypothesis.	1	1,2,6
CO5	To understand the crystal structure of solids , unit cell, Millar indices, and types of lattices. To learn about Superconductivity its properties and its applications in the present world	6	5,6

Course Code: S6- 291E

Course Name: RENEWABLE ENERGY

Upon completion of this course, the student will be able to:		PSO	PO
CO 1	To understand Role of energy in socio economic development and social transformations. To know about Environmental degradation due to energy production and utilization, air and water pollution, depletion of ozone layer and global warming	4	2,4
CO 2	To understand the impact of exponential raise in energy usage on global economy. To learn about Energy resources available in India, Urban and Rural energy consumption and need for use of new renewable energy sources.	1	1,5
CO 3	To understand solar energy, solar water heating system, solar cell, solar cooker, solar types and Applications of solar PV systems. They also learn about principle of wind energy conversion and advantages and disadvantages of wind mills and Applications of wind energy.	6	2,5,6
CO 4	To learn about the principle of ocean thermal energy conversion and wave energy technologies. They also understand the Hydrogen productions methods, Electrolysis of water and problem of hydrogen transport and distribution and uses of Hydrogen use as a fuel.	5	3,4,5
CO5	To understand the conversion of Biomass into fuels, properties of Biomass, Biogas plants and characteristics of biogas.	3	3,5,6