



## LOYOLA COLLEGE OF ARTS AND SCIENCE (Co-Ed.)

(Affiliated to Periyar University – Salem)  
Accredited by NAAC with 'B' Grade (I Cycle)  
Recognised under section 2(f) of the UGC Act 1956  
Mettala, Oilpatty Village,  
Rasipuram Taluk, Namakkal District – 636202.

### Department of Physics

<b>LEARNING OUTCOMES-BASED CURRICULUM FRAMEWORK GUIDELINES BASED REGULATIONS FOR UNDER GRADUATE PROGRAMME</b>	
<b>Programme:</b>	<b>B.Sc. PHYSICS</b>
<b>Programme Code:</b>	<b>08</b>
<b>Duration:</b>	<b>3 years [UG]</b>
<b>Programme Outcomes:</b>	<b>PO1: Disciplinary knowledge:</b> Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate Programme of study
	<b>PO2: Communication Skills:</b> Ability to express thoughts and ideas effectively in writing and orally; Communicate with others using appropriate media; confidently share one's views and express herself/himself; demonstrate the ability to listen carefully, read and write analytically, and present complex information in a clear and concise manner to different groups.
	<b>PO3: Critical thinking:</b> Capability to apply analytic thought to a body of knowledge; analyse and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence; identify relevant assumptions or implications; formulate coherent arguments; critically evaluate practices, policies and theories by following scientific approach to knowledge development.
	<b>PO4: Problem solving:</b> Capacity to extrapolate from what one has learned and apply their competencies to solve different kinds of non-familiar problems, rather than replicate curriculum content knowledge; and apply one's learning to real life situations.
	<b>PO5: Analytical reasoning:</b> Ability to evaluate the reliability and relevance of evidence; identify logical flaws and holes in the arguments of others; analyze and synthesize data from a variety of sources; draw valid conclusions and support them with evidence and examples, and addressing opposing viewpoints.





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	<p><b>PO6:</b> Research-related skills: A sense of inquiry and capability for asking relevant/appropriate questions, problem arising, synthesising and articulating; Ability to recognise cause-and-effect relationships, define problems, formulate hypotheses, test hypotheses, analyse, interpret and draw conclusions from data, establish hypotheses, predict cause-and-effect relationships; ability to plan, execute and report the results of an experiment or investigation</p>
	<p><b>PO7:</b> Cooperation/Team work: Ability to work effectively and respectfully with diverse teams; facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interests of a common cause and work efficiently as a member of a team.</p>





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<p><b>Programme Specific Outcomes:</b></p> <p>(These are mere guidelines. Faculty can create POs based on their curriculum or adopt from UGC or University for their Programme)</p>	<p><b>PSO1: Placement:</b> To prepare the students who will demonstrate respectful engagement with others' ideas, behaviors, and beliefs and apply diverse frames of reference to decisions and actions.</p> <p><b>PSO 2: Entrepreneur:</b> To create effective entrepreneurs by enhancing their critical thinking, problem solving, decision making and leadership skill that will facilitate start-ups and high potential organizations</p> <p><b>PSO3: Research and Development:</b> Design and implement HR systems and practices grounded in researches that comply with employment laws, leading the organization towards growth and development.</p> <p><b>PSO4: Contribution to Business World:</b> To produce employable, ethical and innovative professionals to sustain in the dynamic business world.</p> <p><b>PSO 5: Contribution to the Society:</b> To contribute to the development of the society by collaborating with stakeholders for mutual benefit.</p>
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Paper Code	Paper Title	Course Outcomes	
23UPH03	General Mechanics and Classical Mechanics	CO1	Understand the Newton's Law of motion, understand general theory of relativity, Kepler's laws and realize the basic principles behind planetary motion
		CO2	Acquire the knowledge on the conservation laws
		CO3	Apply conservation law and calculate energy of various systems, understand and differentiate conservative and non-conservative forces
		CO4	Gain knowledge on rigid body dynamics and solve problems based on this concept
		CO5	Appreciate Lagrangian system of mechanics, apply D'Alemberts principle
23UPH04	Optics and Spectroscopy	CO1	Outline basic knowledge of methods of rectifying different defects in lenses, articulate technological applications of eyepieces
		CO2	Discuss the principle of superposition of wave, use these ideas to understand the wave nature of light through working of interferometer
		CO3	Extend the knowledge about nature of light through diffraction techniques; apply mathematical principles to analyse the optical instruments
		CO4	Interpret basic formulation of polarization and gain knowledge about polarimeter, appraise its usage in industries
		CO5	Relate the principles of optics to various fields of IR, Raman and UV spectroscopy and understand their instrumentation and application in industries
23UPH05	Atomic Physics and Lasers	CO1	List the properties of electrons and positive rays, define specific charge of positive rays, know different mass spectrographs.
		CO2	Outline photoelectric effect and the terms related to it, State laws of photoelectric emission, explain experiments and applications of photo





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			electric effect, solve problems based on photoelectric equation.
		CO3	Explain different atom models, Describe different quantum numbers and different coupling schemes.
		CO4	Differentiate between excitation and ionization potentials, Explain Davis and Goucher's experiment, apply selection rule, Analyse Paschen-Back effect, Compare Zeeman and Stark effect.
		CO5	Understand the condition for production of laser, Appreciate various properties and applications of lasers.
23UPH06	Relativity and Quantum Mechanics	CO1	Understand various postulates of special theory of relativity.
		CO2	Appreciate the importance of transformation equations and also the general theory of relativity.
		CO3	Realise the wave nature of matter and understand its importance
		CO4	Derive Schrodinger equation and also realize the use of operators.
		CO5	Apply Schrödinger equation to simple problems.
23UPH07	Electricity and Magnetism	CO1	Define and derive the laws of electricity and magnetism
		CO2	Update the knowledge of properties and magnetism
		CO3	Expertise the skills to manufacture devices
		CO4	Understand the properties of electric and magnetic materials
		CO5	Acquire experimental skills to construct technically useful Devices.
23UPH08	Nuclear and Particle Physics	CO1	Describe various models that explain about the nuclear structures
		CO2	Give reason for various kinds of radioactivity and also know laws governing them





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		CO3	Know the principles and applications of various particle detectors and accelerators.
		CO4	Discuss the concepts used in nuclear reaction.
		CO5	Classify various elementary particles and study the effect of cosmic rays.
23UPH09	Solid State Physics	CO1	Classify the bonding & crystal structure also learn about the crystal structure analysis using X ray diffraction.
		CO2	Understand the lattice dynamics and thus learn the electrical and thermal properties of materials.
		CO3	Give reason for classifying magnetic material on the basis of their behaviour.
		CO4	Comprehend the dielectric behavior of materials.
		CO5	Appreciate the ferroelectric and super conducting properties of materials.
23UPHA01	Allied Physics – I	CO1	Explain types of motion and extend their knowledge in the study of various dynamic motions analyze and demonstrate mathematically. Relate theory with practical applications in medical field.
		CO2	Explain their knowledge of understanding about materials and their behaviors and apply it to various situations in laboratory and real life. Connect droplet theory with Corona transmission.
		CO3	Comprehend basic concept of thermodynamics concept of entropy and associated theorems able to interpret the process of flow temperature physics in the background of growth of this technology.
		CO4	Articulate the knowledge about electric current resistance, capacitance in terms of potential electric field and electric correlate the connection between electric field and magnetic field and analyze them mathematically verify circuits and apply the concepts to construct circuits and study them.





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		CO5	Interpret the real life solutions using AND, OR, NOT basic logic gates and in tend their ideas to universal building blocks. Infer operations using Boolean algebra and acquire elementary ideas of IC circuits. Acquire information about various Govt. programs/ institutions in this field.
23UPHA02	Allied Physics –II	CO1	Explain the concepts of interference diffraction using principles of superposition of waves and rephrase the concept of polarization based on wave patterns
		CO2	Outline the basic foundation of different atom models and various experiments establishing quantum concepts. Relate the importance of interpreting improving theoretical models based on observation. Appreciate interdisciplinary nature of science and in solar energy related applications.
		CO3	Summarize the properties of nuclei, nuclear forces structure of atomic nucleus and nuclear models. Solve problems on delay rate half-life and mean-life. Interpret nuclear processes like fission and fusion. Understand the importance of nuclear energy, safety measures carried and get our Govt. agencies like DAE guiding the country in the nuclear field.
		CO4	To describe the basic concepts of relativity like equivalence principle, inertial frames and Lorentz transformation. Extend their knowledge on concepts of relativity and vice versa. Relate this with current research in this field and get an overview of research projects of National and International importance, like LIGO, ICTS, and opportunities available.
		CO5	Summarize the working of semiconductor devices like junction diode, Zenerdiode, transistors and practical devices we daily use like USB chargers and EV charging stations.



*J. Josephine Selva*

**PRINCIPAL**  
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