DEPARTMENT OF PHYSICS
PROGRAMME OUTCOMES AND COURSE OUTCOMES OF UNDER GRADUATE & POST GRADUATE PROGRAMME (2024 ONWARDS)

NAME OF THE PROGRAMME: BACHELOR OF PHYSICS– PROGRAMME OUTCOME	
PO1	**Disciplinary knowledge:** Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines that form a part of an undergraduate Programme of study
PO2	**Communication Skills:** 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.
PO3	**Critical thinking:** 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.
PO4	**Problem solving: Capacity** to extrapolate from what one has learned and apply their competencies to solve different kinds of nonfamiliar problems, rather than replicate curriculum content knowledge; and apply one's learning to real life situations
PO5	**Analytical reasoning**: 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.
PO6	**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
PO7	**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
PO8	**Scientific reasoning**: Ability to analyse, interpret and draw conclusions from quantitative/qualitative data; and critically evaluate ideas, evidence and experiences from an open-minded and reasoned perspective.

PO9	**Reflective thinking**: Critical sensibility to lived experiences, with self awareness and reflexivity of both self and society.
PO10	**Information/digital literacy:** Capability to use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources; and use appropriate software for analysis of data.
PO11	**Self-directed learning**: Ability to work independently, identify appropriate resources required for a project, and manage a project through to completion.
PO12	**Multicultural competence:** Possess knowledge of the values and beliefs of multiple cultures and a global perspective; and capability to effectively engage in a multicultural society and interact respectfully with diverse groups.
PO13	**Moral and ethical awareness/reasoning**: Ability toembrace moral/ethical values in conducting one's life, formulate a position/argument about an ethical issue from multiple perspectives, and use ethical practices in all work. Capable of demonstratingthe ability to identify ethical issues related to one‟s work, avoid unethical behaviour such as fabrication, falsification or misrepresentation of data or committing plagiarism, not adhering to intellectual property rights; appreciating environmental and sustainability issues; and adopting objective, unbiased and truthful actions in all aspects of work.
PO14	**Leadership readiness/qualities:** Capability for mapping out the tasks of a team or an organization, and setting direction, formulating an inspiring vision, building a team who can help achieve the vision, motivating and inspiring team members to engage with that vision, and using management skills to guide people to the right destination, in a smooth and efficient way.
PO15	**Lifelong learning:** Ability to acquire knowledge and skills, including learning how to learn‟, that are necessary for participating in learning activities throughout life, through self-paced and self-directed learning aimed at personal development, meeting economic, social and cultural objectives, and adapting to changing trades and demands of work place through knowledge/skill development/reskilling.

NAME OF THE PROGRAMME: B.Sc PHYSICS – COURSE OUTCOMES	
SEMESTER I	
PROPERTIES OF MATTER AND SOUND	1.Relate elastic behavior in terms of three modulii of elasticity and working of torsion pendulum. **2** Able to appreciate concept of bending of beams and analyze the expression, quantify and understand nature of materials. **3** Explain the surface tension and viscosity of fluid and support the interesting phenomena associated with liquid surface, soap films provide an analogue solution to many engineering problems. **4** Analyze simple harmonic motions mathematically and apply them. Understand the concept of resonance and use it to evaluate the frequency of vibration. Set up experiment to evaluate frequency of ac mains **5** Understand the concept of acoustics, importance of constructing buildings with good acoustics. Able to apply their knowledge of ultrasonics in real life, especially in medical field and assimilate different methods of production of ultrasonic waves
ENERGY PHYSICS	1. Understanding the energy consumption and prosperity 2. Understanding the principles of semiconductor physics, solar cell operation, performance evaluation and system integration for solar energy conversion. 3. Identifying the components and functions of Wind Energy Conversion Systems. 4. Analyze various biomass conversion technologies, including their advantages and limitations. 5. Understanding of energy storage technologies, design, implementation and management of sustainable energy systems in various domains.
HOME ELECTRICAL INSTALLATION	1. The ability to analyze and design simple electrical circuits. 2. Gain a comprehensive understanding of the production and transmission of electricity. 3. Understand the principles of electrical circuits and safety practices. 4. To prepare participants to confidently and competently undertake electrical installations in residential settings while prioritizing safety, compliance, and professionalism. 5. Knowledge of electrical planning and design principles is important for successful installations.

PHYSICS FOR EVERYDAY LIFE	1. This includes comprehending Newton's laws of motion, the principles of conservation of energy and momentum, and basic concepts of thermodynamics. 2. Students should be able to recognize and apply physics principles in various everyday scenarios. 3. The course should help students develop problem-solving skills by applying physics principles to real-world situations. 4. This includes understanding the limitations of certain technologies or common misconceptions about physics concepts. 5. The course can emphasize interdisciplinary connections between physics and other fields such as biology, chemistry, engineering, and economics.
ASTRO PHYSICS	1. Apply concept of vectors to understand concepts of the physics of celestial objects 2. Appreciate different behavior of astronomical objects present in Nature while learning about phenomena related to these different astronomical objects 3. Quantify in different process and relate astrophysics include cosmology 4. Differentiate different types the composition, atmosphere, and geology of planets and other solar system bodies and understand their basis 5. Relate various properties of astrology's with their behavior and connect them with different natural parameters involved.
INTRODUCTORY PHYSICS	1. The course aims to show how the principles of physics are applied to real-world phenomena, ranging from motion of objects to the behavior of electric circuits. 2. The course aims to develop students' problem-solving skills, particularly in applying physical principles to solve quantitative problems. 3. An introductory physics course often includes laboratory components where students conduct experiments to verify physical principles, analyze experimental data, and draw conclusions. 4. Physics relies heavily on mathematical tools for analysis and problem-solving. 5. The course aims to show how the principles of physics are applied to real-world phenomena, ranging from motion of objects to the behavior of electric circuits.

NAME OF THE PROGRAMME: MASTER OF PHYSICS– PROGRAMME OUTCOME	
PO1	**Problem Solving Skill** Apply knowledge of Management theories and Human Resource practices to Solve business problems through research in Global context.
PO2	**Decision Making Skill** Foster analytical and critical thinking abilities for data-based decision-making..
PO3	**Ethical Value** Ability to incorporate quality, ethical and legal value-based perspectives to all Organizational activities.
PO4	**Communication Skill** Ability to develop communication, managerial and interpersonal skills.
PO5	**Individual and Team Leadership Skill** Capability to lead themselves and the team to achieve organizational goals.
PO6	**Employability Skill** Inculcate contemporary business practices to enhance employability skills in the Competitive environment.
PO7	**Entrepreneurial Skill** Equip with skills and competencies to become an entrepreneur.
PO8	**Contribution to Society** Succeed in career endeavors and contribute significantly to society.
PO9	**Multicultural competence** Possess knowledge of the values and beliefs of multiple cultures and a global perspective.
PO10	**Moral and ethical awareness/reasoning** Ability to embrace moral/ethical values in conducting one's life.

NAME OF THE PROGRAMME: MASTERS IN PHYSICS– COURSE OUTCOMES	
SEMESTER-I	
MATHEMATICAL PHYSICS	1. Understand use of bra-ket vector notation and explain the meaning of complete orthonormal set of basis vectors, and transformations and be able to apply them. 2. Able to understand analytic functions do complex integration, by applying Cauchy Integral Formula. Able to compute many real integrals and infinite sums via complex integration. 3. Analyze characteristics of matrices and its different types, and the process of diagonalization. 4. Solve equations using Laplace transform and analyze the Fourier transformations of different function, grasp how these transformations can speed up analysis and correlate their importance in technology. 5. To find the solutions for physical problems using linear differential equations and to solve boundary value problems using Green's function. Apply special functions in computation of solutions to real world problems

CLASSICAL MECHANICS AND RELATIVITY	1. Understand the fundamentals of classical mechanics. 2. Apply the principles of Lagrangian and Hamiltonian mechanics to solve the equations of motion of physical systems. 3. Apply the principles of Lagrangian and Hamiltonian mechanics to solve the equations of motion of physical systems. 4. Analyze the small oscillations in systems and determine their normal modes of oscillations 5. Understand and apply the principles of relativistic kinematics to the mechanical systems.
LINEAR AND DIGITAL ICs AND APPLICATIONS	1. Learn about the basic concepts for the circuit configuration for the design of linear Integrated circuits and develops skill to solve problems. 2. Develop skills to design linear and non-linear applications circuits using Op-Amp and design the active filters circuits. 3. Gain knowledge about PLL, and develop the skills to design the simple circuits using IC 555 timer and can solve problems related to it. 4. Learn about various techniques to develop A/D and D/A converters. 5. Acquire the knowledge about the CMOS logic, combinational and sequential circuits.
CRYSTAL GROWTH AND THIN FILMS	1. To acquire the knowledge on Nucleation and Kinetics of crystal growth. 2. To understand the Crystallization Principles and Crystal Growth techniques. 3. To study various methods of Crystal growth techniques. 4. To understand the thin film deposition methods. 5. To understand the different characterization techniques.
SOLAR ENERGY UTILIZATION	1. To impart fundamental aspects of solar energy utilization. 2. To give adequate exposure to solar energy related industries. 3. To harness entrepreneurship skills. 4. To understand the different types of solar cells and channelizing them to the different sectors of society. 5. To develop an industrialist mindset by utilizing renewable source of energy.
HUMAN RIGHTS	1. To provide a comprehensive idea of English literature and language over the ages. 2. To help student trace English literature dating from seventh century to present era. 3. To help them to understand the structural development of the English language. 4. To inform them about the various external linguistic influences.

	5. To create the ability of critically examining a text.
PRACTICAL I- ANALOG & DIGITAL EXPERIMENTS	1. Improve the analytical and observation ability in Physics Experiments 2. Conduct experiments on applications of FET and UJT. 3 Analyze various parameters related to operational amplifiers. 4. Understand the concepts involved in arithmetic and logical circuits using IC's . 5. Acquire knowledge about Combinational logic circuits.