Annai College of Arts & Science
Quality Education for Today & Tomorrow
Kovilacheri, Kumbakonam. 612 503. Ph: 0435 2453007
Accredited by NAAC with "B" Grade & Recognized by UGC under Section 2(f) & 12(B)
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DEPARTMENT OF PHYSICS -PG

Programme Outcome, Programme Specific Outcome and Course Outcome

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Programme Outcome:

PO1. Read, understand and interpret physical information – verbal, mathematical and graphical.

PO2. Equip students in methodology related to Physics.

PO3. Impart skills required to gather information from resources and use them.

PO4. To give need based education in physics of the highest quality at the undergraduate level.

PO5. Offer courses to the choice of the students with interdisciplinary approach.

PO6. Perform experiments and interpret the results of observation, including making an assessment of experimental uncertainties.

PO7. Provide an intellectually stimulating environment to develop skills and enthusiasms of students to the best of their potential.

PO8. Communication Technology to Use Information gather knowledge at will.

PO9. Attract outstanding students from all backgrounds.

Programme Specific Outcome:

PSO1. The Board of Studies in Physics (PG) recognizes that curriculum, course content and assessment of scholastic achievement play complementary roles in shaping education.

PSO2. The committee is of the view that assessment should support and encourage the broad instructional goals such as basic knowledge of the discipline of Physics including phenomenology, theories and techniques, concepts and general principles.

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PSO3. This should also support the ability to ask physical questions and to obtain solutions to physical questions by use of qualitative and quantitative reasoning and by experimental investigation.

PSO4. The important student attributes including appreciation of the physical world and the discipline of Physics, curiosity, creativity and reasoned skepticism and understanding links of Physics to other disciplines and to societal issues should gave encouragement.

PSO5. With this in mind, we aim to provide a firm foundation in every aspect of Physics and to explain a broad spectrum of modern trends in physics and to develop experimental, computational and mathematical skills of students.

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Course Outcomes:

The Master of Science in Physics degree for physics majors planning to pursue graduate in physics, applied physics, astrophysics, astronomy, planetary science, geophysics, biophysics, mechanical engineering, electrical engineering, aerospace engineering, or who want a demanding physics degree for other graduate or professional degree programs or for other occupations.

Name of the Course with Subject Code	Course Outcomes
MATHEMATICAL PHYSICS (P 16PY11)	**CO1:** The student shall have acquired advanced general knowledge in Mathematics and Physics, and specialized knowledge in a specific field through the work on the master thesis. **CO2:** The student shall have gained a broad knowledge of the scientific theories and methods of his/her field of study. **CO3:** The student shall know how to apply his/her knowledge on new subject areas within Mathematics, Statistics and/or Physics. **CO4:** The student shall be able to analyze problems within his/her chosen field based upon the field's history, traditions, character and social context.
CLASSICAL DYNAMICS AND RELATIVITY (P16PY12)	**CO1:** Have a deep understanding of Newton's law. **CO2:** Be able to solve the Newton equation for various methods. **CO3:** Understand the foundations of chaotic motif. **CO4:** Understand the Hamilton's equations

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ELECTRONICS (P16PY13)	**CO1:** Construct chose and apply the techniques resources and modern engineering tools required for electronics applications. **CO2:** Develop consciousness of professional ethical and social responsibilities as experts in the field of electronics. **CO3:** Design system components that meet the requirement of public safety and offer solutions to the societal and environmental concerns. **CO4:** Understand the electronic parts in various devices.
METHODS OF SPECTROSCOPY (P16PY14)	**CO1**. Understand the basic principles of various spectroscopic techniques. **CO2:** Analyze spectroscopic terms and selection rules and fine structure. **CO3:** Have a deep understanding microwave and infrared absorption spectroscopy. **CO4:** Be able to solve the UV and ESR spectroscopy.
PRACTICAL (GENERAL AND ELECTRONICS) (P16PY15P)	**CO1:** Study the elliptical fringes experiment. **CO2:** Study the Stefan's, Rydberg's and dielectric constant experiments. **CO3:** Understand the absorption spectrum. **CO4:** Understand the CRO.
ELECTROMAGNETIC THEORY (P 16PY21)	**CO1:** Have an understanding of Maxwell's equations and be able to manipulate and apply them to EM problems. **CO2:** Able to derive and apply the boundary value problems. **CO3:** Analyze electromagnetic waves and wave propagation. **CO4:** Derive the field equations and conservations laws.

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QUANTUM MECHANICS (P 16PY22)	**CO1:** Show an understanding of wave mechanics in three dimensions. **CO2:** Describe the structure of the hydrogen atoms and show understanding of quantization of angular momentum. **CO3:** Understand approximate methods for solving Schrödinger equation (the variation method, perturbation theory, born approximation). **CO4:** Understand time-dependent and time independent Schrodinger equations for simple potential like for instance the harmonic oscillator.
PRACTICAL (MICROPROCESSOR AND PROGRAMMING) (P 16PY23P)	**CO1:** To become familiar with the architecture and instruction set of Intel 8085 microprocessor. **CO2:** To provide practical hands on experience with assembly language programming. **CO3:** To familiarize the students with interfacing of various peripheral devices with 8085 microprocessor. **CO4:** To improve programming logic and concepts of 8085 microprocessor.
MICROPROCESSOR & MICROCONTROLLER (P 16PYE1)	**CO1:** Understand skills of microprocessor. **CO2:** Analyze the interfacing circuit. **CO3:** Understand the mathematical problems using C programming. **CO4:** Understand numerical integration method and numerically solving Schrödinger equations.

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STATISTICAL MECHANICS (P16PY31)	**CO1:** Become familiar with various thermodynamic process and work done in each of this process. **CO2:** Have a clear understanding about micro and macro process and also working of a **CO3:** Knowledge of calculating change in entropy for various processes. **CO4:** Realize the importance of Thermo dynamical functions and applications of Maxwell's relations.
SOLID STATE PHYSICS (P16PY32)	**CO1:** Defines Atomic packing, Crystal, Lattice, Unit cell and Translation vectors. **CO2:** Explains Crystal systems, Crystal planes and directions, Miller indices, Diffraction of waves by crystals and Bragg's law. **CO3:** Knows Reciprocal space, Reciprocal lattice, Construction of reciprocal lattice, Reciprocal lattice vectors and Diffraction condition. **CO4:** Explains Reciprocal space and Laue equations and Brillouin zone.
CRYSTAL GROWTH AND THINFILM PHYSICS (P16PYE3)	**CO1:** Understand basic concepts of nucleation and kinetics of growth of epitaxial films. **CO2:** Analyze growth techniques and crystallization. **CO3:** Understand vapour deposition techniques. **CO4:** Able to derive thin film technique and characterization techniques.
NON LINEAR OPTICS (P16PYE4)	**CO1:** Demonstrate a detailed physical and mathematical understanding of a variety of systems and processes in a range of advanced topics in physics; **CO2:** Apply the concepts and theories of a range of advanced topics in physics; **CO3:** Demonstrate specialized analytical skills and techniques necessary to carry out advanced calculations in a range of advanced topics in physics.

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NON LINEAR OPTICS (P16PYE4)	**CO4:** Approach and solve new problems in a range of advanced topics in physics. **CO5:** Sdemonstrate an understanding of the close relationship between scientific research and the development of new knowledge in a global context.
NUCLEAR AND PARTICLE PHYSICS (P16PY41)	**CO1:** Research on the fundamental constituents of matter to answer unsolved questions about dark matter, antimatter, and the origin and evolution of the universe (CERN). **CO2:** Studies of elementary particles in the universe with the help of telescopes to understand and explain unsolved phenomena. **CO3:** Research on the behavior of nuclear matter under extreme conditions, especially in the form of the quark-gluon plasma that existed for approximately one microsecond after the big bang. **CO4:** Research on the forces that bind atomic nuclei together and on the structure and dynamics of nuclei, including nuclear reactions and their probabilities.
ADVANCED PHYSICS (P16PY42)	**CO1:** Students will demonstrate proficiency in mathematics and the mathematical concepts needed for a proper understanding of physics. **CO2:** Students will demonstrate knowledge of classical mechanics, electromagnetism, quantum mechanics, and thermal physics, and be able to apply this knowledge to analyze a variety of physical phenomena. **CO3:** Students will show that they have learned laboratory skills, enabling them to take measurements in a physics laboratory and analyze the measurements to draw valid conclusions. **CO4:** Students will be capable of oral and written scientific communication, and will prove that they can think critically and work independently.

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NANO PHYSICS (P16PYE5)	**CO1**: Nanostructures and components. **CO2:** Optical microscopy techniques for nano and microstructures including the physical limitations to the resolution of the microscopies. **CO3:** Theoretical methods for the optics of nanostructures including the modeling of electromagnetic fields in nanostructures, the scattering of light by nanostructures, and propagation and absorption of light in nanostructures. **CO4:** Optical response of nonmaterial including effects due to electronic quantization in nanoscale structure.
PRACTICAL (ELECTRONICS) (P16PY43P)	**CO1.** Understand the basics of LDR characteristics. **CO2:** Characteristics of LVDT and strain gauge, torque transducers. **CO3:** Perform the procedures for the working of chua's diode. **CO4:** Understand the gun diode oscillator and voltage dependent resistor.

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