

Department of Physics

M.Sc. Programme (2022-24) Syllabus

Vision

The ultimate goal of the Department of Physics is to bring Eminence and Excellence in Teaching and Learning processes, and to fetch ours as one of the Benchmark Departments with potential for academic excellence.

Mission

To execute the teaching profession to bring the students as an asset for a productive and fascinating career, Successful in their life, and to realize the learning with real-world experience.

Program Educational Objectives:

PEO1	Develop a strong research skill that includes theoretical, experimental and computational Physics.
PEO2	Uphold a sense of academic and social ethics necessary in fulfilling their career objectives
PEO3	Function effectively as an individual or as a team member in research environment and related fields
PEO4	Infuse necessary skill and knowledge to implement new technological approaches in Physics and allied fields
PEO5	Acquire jobs in premier institutes and reputed organizations
PEO6	Ability to meet the challenges as an entrepreneur

Program Outcomes:

PO1	Acquire coherent knowledge and skills within the subject area and emerging development in the fields of Physics (K1/K2)
PO2	Apply appropriate physical principles and methodologies to solve wide range of problems in Physics and its related area of technology (K3)
PO3	Recognize and analyze the importance of different approximation and mathematical methods to describe the physical world (K4)
PO4	Plan, investigate, analyze, interpret, report the findings of the experiment methodically (K5)
PO5	Establish a relationship with theory and experiment by applying to address professional and ethical responsibilities including a respect for diversity (K3)
PO6	Recognize, appreciate and adapt to the different value systems and accept responsibility for sustainable development (K6)

Program Specific Outcomes:

PSO – 01	Hone the knowledge and understanding on the core concepts of physics and apply the generic skills to unravel the nonpareil physical marvels of nature
PSO – 02	Develop a clear insight on the modern tools and techniques to attain a prosperous career with intelligent perception, involvement and innovation

Programme Code:	M.Sc. PHY			Programme Title:	Master of Physics	
Course Code:	22PPS101			Title	Batch:	2022– 2024
Lecture Hrs./Week or Practical Hrs./Week	5	Tutorial Hrs./Sem.	-	Core I: Mathematical Physics	Semester:	I
					Credits:	4

Course Objective

To learn the mathematical concepts and tools required to solve the problems related to physics and to develop the skills essential for solving advanced problems in theoretical physics

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic elements of complex analysis, important differential and integral theorems, Fourier and Laplace transforms.	K1 / K2
CO2	Apply the mathematical skills to solve quantitative problems related to the applications of physics	K3
CO3	Analyze the problems in various domains of physics to choose appropriate method of special differential equations and special integrals	K4
CO4	Evaluate the complicated differentials and integrals using special functions such as Legendre, Bessel, Hermite, beta and gamma functions	K5
CO5	Formulating different mathematical methods and physical laws in terms of complex analysis and tensors with coordinate transforms	K6

Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	H	H	-	-	H	-	H	-
CO2	M	H	-	-	H	-	H	-
CO3	-	M	H	M	M	-	M	M
CO4	-	-	L	H	-	L	-	H
CO5	-	-	-	M	-	M	-	H

H – High; M – Medium; L – Low

Programme Code:	M.Sc. PHY			Programme Title:	Master of Physics	
Course Code:	22PPS102			Title	Batch:	2022 – 2024
				Core II: Classical Mechanics	Semester:	I
Lecture Hrs./Week or Practical Hrs./Week	5	Tutorial Hrs./Sem.	-		Credits:	4

Course Objective

To gain knowledge and understanding of lagrangian and Hamiltonian formulations of mechanics and to apply them to simple systems.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the relation between symmetry operation and classical conservation laws	K1
CO2	Get clear understanding of recent intricate theories of modern physics	K2
CO3	Tackle the new problem and apply the techniques of classical mechanics to far-flung reaches of science	K3
CO4	Provide smooth transition from traditional techniques to rapidly growing area of non-linear dynamics and chaos	K4
CO5	Learn many concepts and key points which will also be used in other subjects Of physics.	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	H	H	H	H	H	H	H	M
CO2	H	M	H	H	M	M	H	H
CO3	M	H	H	M	H	M	H	H
CO4	H	H	H	M	H	H	H	H
CO5	H	H	H	H	H	M	H	H

H–High; M– Medium; L–Low

Programme Code:	M.Sc. PHY			Programme Title:	Master of Physics	
Course Code:	22PPS103			Title	Batch:	2022 – 2024
Lecture Hrs./Week or Practical Hrs./Week	5	Tutorial Hrs./Sem.	-	Core III: Statistical Mechanics	Semester:	I
					Credits:	4

Course Objective

To recognize the properties of macroscopic and microscopic systems with the knowledge of the properties of individual particles using classical and quantum statistics

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the connection between concepts of statistical mechanics and thermodynamics	K1 / K2
CO2	Apply the theories of statistical mechanics to the calculation of macroscopic properties resulting from microscopic models	K3
CO3	Identify the strength and limitations of the models used and be able to compare different microscopic models	K4
CO4	Attain an analytic ability to solve problems relevant to statistical mechanics	K5
CO5	Formulate statistical models of more realistic systems in statistical physics and other core areas of physics	K6

Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	H	H	-	-	H	-	H	-
CO2	M	H	-	-	H	-	H	L
CO3	M	M	H	L	M	-	M	M
CO4	-	-	L	M	-	L	L	H
CO5	-	-	-	M	-	M	-	H

H – High; M – Medium; L – Low

Programme Code:	M.Sc. PHY			Programme Title:	Master of Science	
Course Code:	22PPS1E1			Title	Batch:	2022 – 2024
				Core Elective I - Applied Electronics	Semester:	I
Lecture Hrs./Week	5	Tutorial Hrs./Sem.	-		Credits:	5

Course Objective

To understand the action of semiconductor devices and develop the concepts in the frontier areas of applied electronics

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Acquire the basic knowledge in semiconductor devices and their applications	K1/K2
CO2	Apply the electronic principles to develop circuits for different outputs	K3
CO3	Analyze the electronic circuit systems and trouble shoot them for proper working	K4
CO4	Explain the application of circuit configurations and identify type of electronic component used for proper operation of circuits	K5
CO5	Design oscillators and multi-vibrators with the acquired knowledge on electronics	K6

Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	H	M	M	L	L	L	H	M
CO2	H	H	L	H	H	M	H	H
CO3	H	H	L	M	M	M	M	H
CO4	H	H	M	H	H	M	H	H
CO5	H	H	L	H	H	H	M	M

H – High; M – Medium; L – Low

Programme Code:	M.Sc. PHY		Programme Title:	Master of Science	
Course Code:	22PPS204		Title	Batch:	2022 – 2024
Lecture Hrs./Week	5	Tutorial Hrs./Sem.	Core IV: Foundation of Quantum Mechanics	Semester:	II
				Credits:	4

Course Objective

To understand the basic concepts and formalisms in Quantum mechanics and solve Eigen value problems by applying approximation methods

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the core concepts and abstract formalism of quantum mechanics and the mathematical tools required to formulate problems	K1/K2
CO2	Apply the most appropriate approximation methods to obtain solution for 1D,3D Eigen value problem	K3
CO3	Analyze the role of various quantum mechanical phenomena e.g. angular momentum, scattering theory in modern physics and technology, Compare the properties, establish the relations between them, Interpret and validate the results	K4
CO4	Assimilate all the components of course and select a correct method to find solution for various problems of atomic and molecular dimensions	K5
CO5	Incorporate relevant tools and methodologies of the course to exhibit the skills to test the ideas and solve complexities	K6

Mapping

PO / PSO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO								
CO1	H	M	H	H	L	L	H	M
CO2	H	H	H	M	M	M	H	M
CO3	H	H	H	M	M	M	M	H
CO4	H	H	H	H	H	M	M	H
CO5	H	H	H	H	H	H	M	M

H – High; M – Medium; L – Low

Programme Code:	M.Sc. PHY			Programme Title:	Master of Physics	
Course Code:	22PPS205			Title	Batch:	2022 – 2024
Lecture Hrs./Week or Practical Hrs./Week	5	Tutorial Hrs./Sem.	-	Core V: Electromagnetic theory & Electrodynamics	Semester:	II
					Credits:	4

Course Objective

To develop the basic knowledge about electromagnetic field and plasma physics

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Recollect the basic ideas about electric, magnetic fields	K1
CO2	Understand the applications of electromagnetic field	K2
CO3	Analyze incompleteness of Ampere's law and completion of Maxwell's equation	K4
CO4	Enhanced skill in solving problems by applying electromagnetic field expressions	K5
CO5	Promote fundamental ideas of the unified electromagnetic theory which is present everywhere	K6

Mapping

PO / PSO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO								
CO1	M	H	H	M	H	M	H	M
CO2	H	H	H	M	H	H	H	M
CO3	M	H	H	M	H	M	H	M
CO4	M	M	H	M	H	H	H	M
CO5	H	H	L	H	H	M	H	M

H – High; M – Medium; L – Low

Programme Code:	M.Sc. PHY			Programme Title:	Master of Science	
Course Code:	22PPS206			Title	Batch:	2022-2024
Lecture Hrs./Week or Practical Hrs./Week	5	Tutorial Hrs./Sem.	-	Core VI: Condensed Matter Physics	Semester:	II
					Credits:	4

Course Objective

To provide coherent perspective of the physical concepts and theories related with the characterization of materials

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the depth information of crystal structures	K2
CO2	Apply knowledge of crystallographic techniques to elucidate the various properties in the solid-state physics	K3
CO3	Analyze the different properties like electric, magnetic and thermal and develop the skills for research	K4
CO4	Evaluate the possibility of superconductors in industry and medical applications	K5
CO5	Create new materials based on a fundamental understanding of their properties	K6

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	H	M	M	M	-	-	H	-
CO2	M	H	M	-	H	L	M	L
CO3	L	M	H	M	M	L	H	M
CO4	L	M	H	M	M	M	L	M
CO5	-	L	M	M	H	H	L	H

H-High; M-Medium; L-Low

Programme Code:	M.Sc. PHY			Programme Title:	Master of Science	
Course Code:	22PPS2E3			Title	Batch:	2022 – 2024
Lecture Hrs./Week	5	Tutorial Hrs./Sem.		Core Elective II: Electronic Communications and Cyber security	Semester:	II
					Credits:	4

Course Objective

To develop the scientific skills in the Electronic Communication Systems and Cyber Security

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the various modulation techniques and the generation of microwaves and concepts of internet cyber security	K1/K2
CO2	Apply the basic physical concepts in analog, pulse and digital communication	K3
CO3	Implement the modulation techniques in the communication systems	K4
CO4	Evaluate the critical problems in communication systems	K5
CO5	Create the new digital transmission circuits used to modulate the signals	K6

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	H	L	L	H	M	L	H	M
CO2	H	M	L	M	H	M	H	H
CO3	H	M	L	M	H	M	M	H
CO4	H	H	M	H	H	M	L	H
CO5	H	H	M	H	H	H	M	M

H – High; M – Medium; L – Low

Programme Code:	M.Sc. PHY			Programme Title:	Master of Physics	
Course Code:	22PPS2N1			Title	Batch:	2022 – 2024
Lecture Hrs./Week or Practical Hrs./Week	1	Tutorial Hrs./Sem.	-	Non Major Elective: Non-Conventional Energy Sources	Semester:	II
					Credits:	2

Course Objective

To study the basic concepts and applications of non-conventional energy sources

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Recollect the applications of physics in real world	K1
CO2	Understand the principles of physics involving various natural and artificial process	K2
CO3	Recognize the need of non-conventional energy sources	K3
CO4	Implement the basics laws of physics in the field of non-conventional energy sources	K3
CO5	Analyze the efficiency of devices and instruments used in the production of energy	K4

Mapping

CO \ PO / PSO	PO						PSO	
	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	H	M	L	-	-	-	M	-
CO2	H	H	-	H	M	M	-	M
CO3	-	-	-	M	-	M	M	-
CO4	M	H	L	H	H	-	-	M
CO5	-	-	M	H	M	-	M	M

H – High; M – Medium; L – Low

Programme Code:	M.Sc. PHY			Programme Title:	Master of science	
Course Code:	22PPS2N2			Title	Batch:	2022-2024
Lecture Hrs./Week or Practical Hrs./Week	1	Tutorial Hrs./Sem.	-	Non Major Elective: Biomedical Instrumentation	Semester:	II
					Credits:	2

Course Objective

To apply knowledge of physics in the field of biomedical instrumentation

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Recollect the basics of physics related to biology	K1
CO2	Acquire the prior knowledge of fundamental concepts, functioning and applications of physiological devices.	K2
CO3	Implement the knowledge in the construction and operation of instruments	K3
CO4	Analyze the process of operation	K4
CO5	Evaluate the technologies and model used in the biomedical instrumentation.	K5

Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	H	M	-	L	-	-	M	-
CO2	H	M	-	H	M	-	M	-
CO3	M	-	L	M	L	-	-	M
CO4	-	-	-	M	M	L	-	L
CO5	-	L	M	H	M	L	M	-

H – High; M – Medium; L – Low

Programme Code:	M.Sc. PHY			Programme Title:	Master of Physics	
Course Code:	22PPS207			Title	Batch:	2022 – 2024
Lecture Hrs./Week or Practical Hrs./Week	4	Tutorial Hrs./Sem.	-	Core VII: General Physics Lab I	Semester:	I & II
					Credits:	4

Course Objective

To develop the skill to gain knowledge in experimental techniques

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand and familiarize with the basics of experimental physics	K1/K2
CO2	Apply the knowledge in performing the experiments	K3
CO3	Analyze the working of the apparatus	K4
CO4	Evaluate and compare the experimental results with theoretical values	K5
CO5	Design new experimental set up to validate the theory	K6

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	H	H	H	H	H	H	H	H
CO2	M	M	H	M	H	M	H	H
CO3	H	H	H	H	H	H	H	H
CO4	M	H	H	H	H	H	H	H
CO5	H	M	H	M	H	H	H	H

H – High; M – Medium; L – Low

Programme Code:	M.Sc. PHY			Programme Title:	Master of Physics	
Course Code:	22PPS208			Title	Batch:	2022 – 2024
Lecture Hrs./Week or Practical Hrs./Week	4	Tutorial Hrs./Sem.	-	Core VIII: Electronics Lab I	Semester:	I & II
					Credits:	4

Course Objective

- To understand the working of semiconductor devices, amplifiers and oscillators.

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Procure the knowledge of characteristics of semiconductor devices	K1/K2
CO2	Apply the basic principles of electronics to verify the various device characteristics	K3
CO3	Analyze the theory of transistors, capacitors, resistors and implement the knowledge with workable circuits	K4
CO4	Troubleshoot the combinational circuits using digital IC's	K5
CO5	Develop the devices like regulated power supply by using the principles of electronics	K6

Mapping

PO / PSO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO								
CO1	H	H	L	M	H	L	H	M
CO2	H	H	L	H	H	L	H	H
CO3	H	M	M	H	H	L	M	H
CO4	H	M	M	M	H	L	M	H
CO5	H	H	L	H	H	H	M	H

H – High; M – Medium; L – Low

Programme Code:	M.Sc. PHY			Programme Title:	Master of Science	
Course Code:	22PPS309			Title	Batch:	2022 – 2024
Lecture Hrs./Week	5	Tutorial Hrs./Sem.		Core X: Advanced Quantum Mechanics	Semester:	III
					Credits:	4

Course Objective

To familiarize with advanced concepts and methodology of quantum mechanics, quantization of fields and central force problems

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Demonstrate understanding of basic principles of quantum, concepts and terminology of Quantum mechanics and their applications to various physical and chemical problems and gain an insight in the quantum field theory	K1/K2
CO2	Apply the concepts of quantum mechanics to quantitatively predict the behavior of physical Systems such as Atomic, Nuclear, Molecular, Solid state and statistical physics	K3
CO3	Analyze and apply the modern quantum mechanical methods for determining electronic structure of molecules and atoms	K4
CO4	Integrate several components to find solution to the problems in Molecular and elementary particle physics by choosing an appropriate theoretical method	K5
CO5	Adopt systematic methodology and relevant tool to find solution to problems of modern physics, interpret the findings and communicate the results effectively	K6

Mapping

PO / PSO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO								
CO1	H	M	H	H	L	L	H	M
CO2	H	H	H	M	M	M	H	M
CO3	H	H	H	M	M	M	M	H
CO4	H	H	H	H	H	M		H

CO5	H	H	H	H	H	H	M	M
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H – High; M – Medium; L – Low

ProgrammeCode:	M.Sc.PHY			Programme Title:	Master of Physics		
CourseCode:	22PPS310			Title	Batch:	2022 – 2024	
Lecture Hrs./Week or Practical Hrs./Week	5	TutorialHrs./Sem.	-	Core IX: Molecular Spectroscopy	Semester:	III	
					Credits:	4	

Course Objective

To develop the skill to gain knowledge in group theory and different spectroscopic techniques

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the symmetry of molecules and principle of different spectroscopic techniques	K1/K2
CO2	Apply symmetry operations to predict the point group of molecules	K3
CO3	Analyze the different motions of molecules and predict Microwave, IR and Raman activity	K4
CO4	Evaluate the conditions for resonance in NMR, ESR, NQR and Mossbauer Spectroscopy	K5
CO5	Create a character table and predict IR and Raman activity for new compounds	K6

Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	H	H	H	H	M	H	H	H
CO2	H	H	H	H	M	H	H	H
CO3	H	H	H	M	M	H	H	H
CO4	H	M	M	H	H	H	H	H
CO5	H	H	H	H	H	H	H	H

H–High; M– Medium; L–Low

Programme Code:	M.Sc. PHY			Programme Title:	Master of Science	
Course Code:	22PPS3E5			Title	Batch:	2022 – 2024
				Core Elective III: Thin film & Nano science	Semester:	III
Lecture Hrs./Week	5	Tutorial Hrs./Sem.	-		Credits:	5

Course Objective

To develop the knowledge about fundamentals of Thin Film and Nano science

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the concepts of Growth process of Thin film materials and familiarize with the basics of Nanotechnology and Quantum structure	K1/K2
CO2	Apply the various methodologies to fabricate materials	K3
CO3	Categorize the materials according to their size	K4
CO4	Summarize the various properties of thin materials and nanomaterials using several characterization techniques	K5
CO5	Synthesis thin-film materials and Nano-materials for several applications	K6

Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	H	M	L	L	-	L	H	H
CO2	M	H	-	-	-	-	M	H
CO3	M	M	M	H	-	-	M	H
CO4	-	-	-	H	-	-	-	H
CO5	-	-	-	-	H	M	H	H

H – High; M – Medium; L – Low

Programme Code:	M.Sc. PHY			Programme Title:	Master of Physics	
Course Code:	22VAD301			Title	Batch:	2022 – 2024
Lecture Hrs./Week or Practical Hrs./Week	-	Tutorial Hrs./Sem.	-	Value Added Course: Python Programming	Semester:	III
					Credits:	GRADE

Course Objective

To introduce Python programming to solve scientific and technological problems

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Acquire the knowledge to analyze the problem	K1 / K2
CO2	Plan to write the algorithm of a program with the knowledge of mathematical operators, logical operators, conditional and looping statements	K3
CO3	Analyze the problems in various domains of physics to write the program using python codes	K4
CO4	Explain clearly the importance of different function statements and pass the arguments between functions	K5
CO5	Device and compile the python programming for application in the field of science and technology	K6

Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	M	M	M	H	H	L	H	M
CO2	M	H	M	L	H	L	H	H
CO3	L	M	H	M	M	M	M	M
CO4	M	L	L	H	H	H	M	H
CO5	L	M	L	M	H	H	M	H

H – High; M – Medium; L – Low

Programme Code:	M.Sc. PHY			Programme Title:	Master of Physics	
Course Code:	22PPS411			Title	Batch:	2022 – 2024
Lecture Hrs./Week or Practical Hrs./Week	5	Tutorial Hrs./Sem.	-	Core XI: Lasers & Non-Linear Optics	Semester:	IV
					Credits:	4

Course Objective

To develop the skill to gain knowledge in the basic principles of Laser and Non-linear optics

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic principle of laser and its interaction with matter	K1/K2
CO2	Apply the principle and demonstrate the working of different types of Lasers	K3
CO3	Analyze the performance of laser and improve the quality	K4
CO4	Evaluate the role of laser in nonlinear optics	K5
CO5	Design a Q-switched laser for nonlinear optical studies	K6

Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	H	M	H	H	H	H	H	H
CO2	M	H	H	H	H	H	H	H
CO3	M	H	H	H	H	H	H	H
CO4	H	M	H	H	H	H	H	H
CO5	H	M	H	H	H	H	H	H

H – High; M – Medium; L – Low

Programme Code:	M.Sc. PHY			Programme Title:	Master of Science	
Course Code:	22PPS412			Title	Batch:	2022-2024
Lecture Hrs./Week or Practical Hrs./Week	5	Tutorial Hrs./Sem.	-	Core XII: Nuclear & Particle Physics	Semester:	IV
					Credits:	4

Course Objective

To study the nuclear structure and properties of nuclei through nuclear models

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Acquire basic knowledge on the properties, structure of nucleus and nuclear reactions	K1
CO2	Understand the properties and significance of stable nucleus through different types of nuclear models	K2
CO3	Apply the basic concepts in the classification of elementary particles like quarks, Higgs bosons	K3
CO4	Analyze problem solving skills in nuclear physics and pave a way to research in nuclear physics	K4
CO5	Evaluate the fundamental properties of elementary particles, as well as symmetries and the standard model	K5

Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	H	M	L	-	M	-	H	-
CO2	H	M	L	-	M	-	M	-
CO3	L	H	M	L	H	-	M	L
CO4	-	M	H	M	M	L	L	M
CO5	-	M	H	H	L	M	-	H

H-High; M-Medium; L-Low

Programme Code:	M.Sc. PHY			Programme Title:	Master of science	
Course Code:	22PPS4E7			Title	Batch:	2022-2024
Lecture Hrs./Week or Practical Hrs./Week	5	Tutorial Hrs./Sem.	-	Core Elective IV: Microprocessor & Object-Oriented Programming with C++	Semester:	IV
					Credits:	5

Course Objective

- To acquire knowledge about microprocessor and object-oriented programs

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Acquire the knowledge of various instruction set of the Microprocessor Intel 8085	K1/K2
CO2	Apply the various C++ functional operators to build a secure program	K3
CO3	Analyze the method of interfacing of different programmable devices	K4
CO4	Solve problems in Physics based on Microprocessor and OOPS	K5
CO5	Design programs based on microprocessor for various applications like traffic light controller, stepper motor, A/D Converter and D/A Converter	K6

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	H	M	-	M	H	L	H	H
CO2	H	H	L	M	H	L	H	H
CO3	H	H	M	H	H	L	H	H
CO4	H	H	H	H	H	L	M	M
CO5	H	H	L	H	H	H	H	H

Programme Code:	M.Sc. PHY			Programme Title:	Master of Physics	
Course Code:	22PPS413			Title	Batch:	2022 – 2024
Lecture Hrs./Week or Practical Hrs./Week	4	Tutorial Hrs./Sem.	-	Core XIII: General Physics Lab II	Semester:	III & IV
					Credits:	5

Course Objective

To achieve a practical knowledge by applying the experimental methods to correlate with the Physics theory and analyze the experimental data

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Understand the theoretical concepts behind every experimental methods	K1 / K2
CO2	Apply the Knowledge of theory and analytical techniques to interpret experimental data	K3
CO3	Analyze the experimental results with mathematical concepts to obtain quantitative results	K4
CO4	Communicate the procedure and outcomes of an experiment	K5
CO5	Design new methodology to perform an experiment with the possible equipment in general physics laboratory	K6

Mapping

PO / PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	M	M	-	-	-	-	H	-
CO2	M	M	-	-	H	M	H	M
CO3	-	L	M	M	M	M	M	H
CO4	-	-	L	H	H	H	M	H
CO5	-	-	L	M	H	H	-	H

H – High; M – Medium; L – Low

Programme Code:	M.Sc. PHY			Programme Title:	Master of Science	
Course Code:	22PPS414			Title	Batch:	2022 – 2024
				Core XIV: Electronics Lab II	Semester:	III & IV
Lecture Hrs./Week	4	Tutorial Hrs./Sem.	-		Credits:	5

Course Objective

To know the action and applications of operational amplifier and to become familiarize with 8085 microprocessor

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	Gain knowledge and understanding of IC'S and Microprocessor 8085	K2
CO2	Apply the theoretical knowledge and skill to design circuit, make Measurements, analyze and interpret the experimental data.	K3
CO3	Enhance the logical thinking and ability by writing simple programmes using 8085 microprocessor and employ the technical expertise for interfacing devices	K4
CO4	Incorporate all the necessary tools and skills to devise practical circuits that perform desired operations	K5
CO5	Ability to Augment the present day requirements in industries and research fields by developing their own firm or fetch an employment as a Design engineer	K6

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	H	H	M	M	M	L	H	H
CO2	H	H	H	H	M	M	H	H
CO3	H	H	H	H	M	M	M	L
CO4	H	H	H	H	H	H	M	M
CO5	H	H	H	H	H	H	M	H

H – High; M – Medium; L – Low

Programme Code:	M.Sc. PHY			Programme Title:	Master of Science	
Course Code:	22PPS415			Title	Batch:	2022 – 2024
Lecture Hrs./Week	2	Tutorial Hrs./Sem.	-	Core XV: Computer Lab in C++	Semester:	IV
					Credits:	3

Course Objective

To acquire basic knowledge in object oriented programming

Course Outcomes

On the successful completion of the course, students will be able to

CO Number	CO Statement	Knowledge Level
CO1	To remember the basic C++ language	K1 / K2
CO2	To apply the concepts and benefits of OOPs	K3
CO3	To analyze the functions of various C++ operators	K4
CO4	To evaluate the C++ language to solve problems in Physics	K5
CO5	To create the C++ language programs	K6

Mapping

PO/PSO CO	PSO1	PSO2	PSO3	PSO4	PSO5	PO6	PSO1	PSO2
CO1	H	M	H	M	M	H	M	H
CO2	M	-	M	M	H	H	-	M
CO3	M	H	M	M	M	L	H	-
CO4	M	L	H	H	M	H	M	M
CO5	H	M	-	M	H	-	H	-

H – High; M – Medium; L – Low

