

Department of Physics

M.Sc. Programme

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:	MSC	Programme Title:	Master of Science	
Course Code:	20PPS101	Title	Batch:	2020- 2022
		Core I: Classical Mechanics	Semester:	I
Hrs/Week:	5		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

K1	CO1	To understand the relation between symmetry operation and classical conservation laws
K2	CO2	To tackle the new problem and application techniques of classical mechanics to far-flung reaches of science
K3	CO3	To get clear understanding of recent intricate theories of modern physics
K4	CO4	To provide smooth transition from traditional techniques to rapidly growing area of non-linear dynamics and chaos

Mapping

PSO/CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	H	H
CO2	H	M	H	H	M
CO3	M	H	H	M	H
CO4	H	H	H	M	H

H – High; M – Medium; L – Low

Programme Code:	MSC	Programme Title:	Master of Science	
Course Code:	20PPS102	Title	Batch:	2020 - 2022
		Core II : Quantum Mechanics	Semester:	I
Hrs/Week:	5		Credits:	4

Course Objective

- To understand the basic concepts and formalisms in Quantum mechanics

Course outcomes

K1	CO1	Gain good understanding of the principles of quantum mechanics
K2	CO2	Relate abstract formalism to matrix and wave mechanics
K3	CO3	Develop deep knowledge on the role of angular momentum and scattering phenomena in modern physics and technology
K4	CO4	Apply the most appropriate approximation method for solving specific problems

Mapping

PSO/CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	M	H	M	H
CO2	M	H	M	H	L
CO3	L	H	M	H	M
CO4	H	M	H	M	M

H – High; M – Medium; L – Low

Programme Code:	MSC	Programme Title:	Master of Science	
Course Code:	20PPS204	Title	Batch:	2020 - 2022
		Core IV: Statistical Mechanics	Semester:	II
Hrs/Week:	5		Credits:	4

Course Objective

- To understand the concepts of Statistical Mechanics and to apply these concepts to various physical phenomena.

Course outcomes

K1	CO1	To understand the concept of statistical mechanics
K2	CO2	To study the physical properties of a mechanical system in a situation when description is incomplete.
K3	CO3	To understand the average value of thermodynamic system and get clarity on equilibrium and non-equilibrium system
K4	CO4	To explain the microscopic properties of a system on the basis of the dynamical behavior of its constituent particle and realization of atomic theory of matter

Mapping

PSO/CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	M	H	M	H
CO2	H	M	M	H	M
CO3	M	H	H	M	L
CO4	L	H	H	M	H

H – High; M – Medium; L – Low

Programme Code:	MSC	Programme Title:	Master of Science	
Course Code:	20PPS206	Title	Batch:	2020 - 2022
		Core VI: Electromagnetic theory & Electrodynamics	Semester:	II
Hrs/Week:	5		Credits:	4

Course Objective

- To develop the basic knowledge about electromagnetic field and plasma physics

Course outcomes

K1	CO1	To recollect the basic ideas about electric, magnetic fields and fourth state of matter
K2	CO2	To understand the applications of electromagnetic field and plasma physics
K3	CO3	To analyze incompleteness of Ampere's law and completion of Maxwell's equation
K4	CO4	Enhanced skill in solving problems by applying electromagnetic field expressions

Mapping

PSO/CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	H	M	H
CO2	H	H	H	M	H
CO3	M	H	H	M	H
CO4	M	M	H	M	H

H – High; M – Medium; L – Low

Programme Code:	MSC	Programme Title:	Master of Science	
Course Code:	20PPS208	Title	Batch:	2020 - 2022
		Core VIII: General Physics Lab I	Semester:	I & II
Hrs/Week:	4		Credits:	4

Course Objective

- To understand the techniques of advanced physics experiments

Mapping

PSO/CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	H	H
CO2	H	M	M	H	M
CO3	M	H	H	M	M

H – High; M – Medium; L – Low

Programme code:	MSC	Programme Title :	Master of Science	
Course Code:	19PPS310	Title	Batch :	2019-2021
		Core X: Molecular Spectroscopy	Semester	III
Hrs/Week:	5		Credits:	4

Course Objective

- To develop the skill to gain knowledge in Molecular Spectroscopy

Course Outcomes

K1	CO1	To recollect Symmetry operations and learn about Group theory
K2	CO2	To understand the origin of Microwave, Raman and IR spectroscopy
K3	CO3	To deploy the conditions for resonance in NMR, ESR, NQR and Mossbauer Spectroscopy
K4	CO4	To review the theory and applications of NMR, ESR, NQR and Mossbauer Spectroscopy

Mapping

PSO/CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	H	H
CO2	S	S	S	H	H
CO3	S	H	H	H	S
CO4	S	S	S	H	H

S – Strong; H – High; M – Medium; L – Low

Programme Code:	MSC	Programme Title:	Master of Science	
Course Code:	19PPS3E2	Title	Batch:	2019-2021
		Major Elective III: Thin film & Nano science	Semester:	III
Hrs/Week:	5		Credits:	5

Course Objective

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

Course outcomes

K1	CO1	To understand the concepts of Thin Films
K2	CO2	To study the design of different synthesis methodologies of thin film and nanoscience
K3	CO3	To familiarize with the basics of Nanotechnology and Quantum structure
K4	CO4	To understand the characteristic techniques of various analysis

Mapping

PSO/CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	S	H	S	H
CO2	S	M	S	H	H
CO3	S	H	S	H	S
CO4	S	S	S	H	H

S – Strong; H – High; M – Medium; L – Low

Programme Code:	MSC	Programme Title:	Master of Science	
Course Code:	19PPS311	Title	Batch:	2019 - 2021
		Core XI: Condensed Matter Physics	Semester:	III
Hrs/Week:	5		Credits:	4

Course Objective

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

Course outcomes

K1	CO1	Provide an in-depth knowledge of structure of crystals
K2	CO2	Analyze the different properties like electric, magnetic and thermal and develop the skills for research
K3	CO3	Acquire deep understanding in the field of material science
K4	CO4	To emphasize the applications of superconductors in industry and medical fields

Mapping

PSO/CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	M	S	M
CO2	H	M	S	H	H
CO3	M	S	H	M	S
CO4	S	M	L	M	H

S – Strong; H – High; M – Medium; L – Low

Programme code:	MSC	Programme Title :	Master of Science	
Course Code:	19PPS412	Title	Batch :	2019 - 2021
		Core XII: Lasers & Non-Linear Optics	Semester:	IV
Hrs/Week:	5		Credits:	4

Course Objective

- To develop the skill to gain knowledge in Lasers and Non-linear optics

Course Outcomes (CO)

K1	CO1	To keep in mind the basic principle and characteristics of Lasers
K2	CO2	To get the idea about the action of various types of Lasers, performance improvement and their applications
K3	CO3	To implement Laser in Non-linear optics
K4	CO4	To review the ideas and concepts of Laser Spectroscopy

Mapping

PSO/CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	H	S	S	H
CO2	H	H	S	H	H
CO3	S	H	H	S	S
CO4	H	S	H	S	H

S – Strong; H – High; M – Medium; L – Low

Programme Code:	MSC	Programme Title:	Master of Science	
Course Code:	19PPS413	Title	Batch:	2019 - 2021
		Core XIII: Nuclear & Particle Physics	Semester:	IV
Hrs/Week:	5		Credits:	4

Course Objective

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

Course outcomes

K1	CO1	Understand the basic properties and structure of nucleus and nuclear reactions
K2	CO2	Analyze the properties and significance of stable nucleus through different types of nuclear models
K3	CO3	Elucidate the latest development in the classification of elementary particles like quarks, Higgs bosons
K4	CO4	Develop skills in solving problems in nuclear physics and pave a way to research in nuclear physics

Mapping

PSO/CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	S	H	S
CO2	S	H	M	H	M
CO3	H	M	H	M	S
CO4	S	M	S	M	H

S – Strong; H – High; M – Medium; L – Low

Programme Code:	MSC	Programme Title:	Master of Science	
Course Code:	19PPS414	Title	Batch:	2019-2021
		Core XIV: General Physics Lab II	Semester:	III & IV
Hrs/Week:	4		Credits:	5

Course objective

- To become familiar with the techniques of advanced General Experiments.

Course outcomes

K3	CO1	Become familiar with techniques of advanced general experiments
K4	CO2	Impart the broad knowledge of experimental methods and measurement techniques
K5	CO3	Familiarize analytical calculations

Mapping

PSO/CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	M	S
CO2	M	S	H	S	H
CO3	M	S	S	S	S

S – Strong; H – High; M – Medium; L – Low

Programme Code:	MSC	Programme Title:	Master of Science	
Course Code:	19PPS4E3	Title	Batch:	2019-2021
		Major Elective III: Microprocessor & Object-Oriented Programming With C++	Semester:	IV
Hrs/Week:	5		Credits:	5

Course Objective

- To acquire knowledge about microprocessor and object oriented programs

Course outcomes

K1	CO1	To enhance the knowledge of various instruction set of the Microprocessor Intel 8085
K2	CO2	To understand the method of interfacing of different programmable devices.
K3	CO3	To apply the various C++ functional operators to build a secure program
K4	CO4	To solve problems in Physics based on microprocessor and OOPS

Mapping

PSO/CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	S	H	S	H
CO2	S	H	S	H	H
CO3	H	H	H	S	S
CO4	S	H	S	H	H

S – Strong; H – High; M – Medium; L – Low

Programme Code:	MSC	Programme Title:	Master of Science	
Course Code:	20PPS415	Title	Batch:	2020-2022
		Core XV: Electronics Lab II	Semester:	III & IV
Hrs/Week:	4		Credits:	5

Course Objective

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

Course outcomes

K3	CO1	Gain knowledge and understanding of the components and equipments
K4	CO2	Design analog circuits, make measurements, analyze and interpret the experimental data.
K5	CO3	Use the 8085 microprocessor for interfacing devices.

Mapping

PSO/CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	M	H	H	M
CO2	H	L	M	L	H
CO3	M	H	M	M	H

S – Strong; H – High; M – Medium; L – Low

Programme Code:	MSC	Programme Title:	Master of Science	
Course Code:	20PPS416	Title	Batch:	2020-2022
		Core XVI: Computer Lab in C++	Semester:	IV
Hrs/Week:	2		Credits:	3

Course Objective

- To acquire basic knowledge in object oriented programming

Course outcomes

K3	CO1	To understand the concepts and benefits of OOPs
K4	CO2	To analyze the functions of various C++ operators
K5	CO3	To apply the C++ language to solve problems in Physics.

Mapping

PSO/CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	H	H
CO2	H	H	H	M	M
CO3	H	H	H	H	H

H – High; M – Medium; L – Low