Nallamuthu Gounder Mahalingam College

(An Autonomous Institution, Affiliated to Bharathiar University)

90,PalghatRoad,Pollachi -642001,Coimbatore, Tamil Nadu, India.

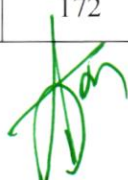95th Rank in NIRF –2023 - Among Colleges in India.

6.5.1. Internal Quality Assurance Cell (IQAC) / Internal Quality Assurance System (IQAS) has contributed significantly for Institutionalizing the quality assurance strategies and processes, by constantly reviewing the teaching learning process structures and methodologies of operations and learning outcomes at periodic intervals.

S.No		Syllabus with PEOs, POs, PSOs and COs	Page No.
1	UG Batch	Batch PEO,PO,PSO	2
		Batch 2019-2022	4
		Batch 2020-2023	32
		Batch 2021-2024	30

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2	PG Batch	Batch PEO,PO,PSO	103
		Batch 2019-2021	105
		Batch 2020-2022	123
		Batch 2021-2023	148
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Department of Physics

B.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	Ability to successfully pursue forefront research in their field of interest and engage themselves in lifelong learning process
PEO2	Demonstrate the ability to use skills in Physics and its related areas of technology for formulating and tackling Physics-related problems
PEO3	Acquire jobs in varies service domains like Government, teaching, information, banking and industry
PEO4	Uphold professional ethics, exhibit critical thinking and demonstrate innovative ideas to function as a leader in diverse fields
PEO5	Enhance the Analytical, technical, computational and experimental skills to solve physics related problems individually and collectively
PEO6	Empower the students to establish new identity by articulating their knowledge and understanding of modern digital tools to locate, present and retrieve information

Program Outcomes:

PO1	Acquire fundamental/systematic or coherent understanding of the academic field of Physics and procedural knowledge that creates different types of professionals related to the disciplinary/subject area of Physics. (K1/K2)
PO2	Demonstrate the ability to use skills in Physics and its related areas of technology. (K3)
PO3	Recognize the importance of mathematical modeling, simulation and computing, and the role of approximation and mathematical approaches to describe the physical world. (K4)
PO4	Plan and execute Physics-related experiments or investigations, analyze and interpret data/information collected using appropriate methods. (K5)
PO5	Demonstrate relevant generic skills and global competencies to tackle open-ended problems that belong to the disciplinary - area Boundaries to work individually and collectively. (K3)
PO6	Demonstrate professional behavior to promote safe learning and working environment. (K6)

Program Specific Outcomes:

PSO - 01	Acquire knowledge and understanding of the core concept of Physics and their applications.
PSO - 02	Inculcate relevant skills to succeed in higher education or fetch jobs in Government/Public sectors.

Programme Code:	BSc	Programme Title:	Bachelor of Science	
Course Code:	19UPS101	**Title**	**Batch:**	2019-2022
		Core I: Properties of Matter	**Semester:**	I
Hrs/Week:	3		Credits:	3

Course Objective

- To understand the basic concepts of gravitation and to get exposure to the properties of liquids and solids

Course outcomes

K1	CO1	To recollect the physical properties of different states of matter
K2	CO2	To understand the applications of the elastic properties of solids
K3	CO3	To implement the knowledge of properties for the thermal expansion of solids
K4	CO4	To analyze the diffusion of gases in various media

Mapping

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

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

Programme Code:	BSc	Programme Title:	Bachelor of Science	
Course Code:	19UPS102	**Title**	**Batch:**	2019-2022
		Core II: Mechanics & Sound	**Semester:**	I
Hrs/Week:	3		Credits:	3

Course Objective

- To acquire a complete knowledge about mechanics and sound
-

Course outcomes

K1	CO1	To remember the principles of rigid body, statics, dynamics and sound
K2	CO2	To understand the mechanics behind rigid body, projectiles and dynamics
K3	CO3	To analyze the characteristics of sound and requisites of good acoustics
K4	CO4	To solve problems based on dynamics

Mapping

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

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

Programme Code:	BSc	Programme Title:		Bachelor of Science	
Course Code:	19 UPS203	**Title**		**Batch:**	2019-2022
		Core III: Heat & Thermodynamics		**Semester:**	II
Hrs/Week:	5			**Credits:**	5

Course Objective

- To understand of the fundamental laws and principles of thermodynamics and heat transfer

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Course outcomes

K1	CO1	To recognize the difference between heat and temperature
K2	CO2	To understand the fundamental laws and principles of heat transfer and theory of gases
K3	CO3	To acquire working knowledge on low temperature physics and its domestic applications
K4	CO4	To analyse and evaluate various thermodynamic cycles used for energy productions

Mapping

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

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

Programme code:	BSc	Programme Title :		Bachelor of Science	
Course Code:	19UPS204	**Title**		**Batch :**	2019-2022
		Core IV: Physics Lab I		**Semester**	I & II
Hrs/Week:	3			**Credits:**	3

Course Objective

- To develop the skill to gain knowledge in Physics Lab I

Course Outcomes

K3	CO1	To recollect the basic principles taught
K4	CO2	To understand and apply the knowledge of theory to experiments
K5	CO3	To validate the experiment with theory

Mapping

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

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

Programme Code:	BSc	Programme Title:		Bachelor of Science	
Course Code:	19UPS305	**Title**		**Batch:**	2019-2022
		Core V: Electricity & Magnetism		**Semester:**	III
Hrs/Week:	5			**Credits:**	5

Course Objective

- To demonstrate the knowledge of electricity and magnetism in formulating and solving practical problems.

Course outcomes

K1	CO1	To acquire the knowledge on fundamental concepts of electric and magnetic field
K2	CO2	To understand the concept of electric field, potential and electromagnetic induction
K3	CO3	To implement the ideas for making the electrical devices such as capacitor, inductor, resistance, etc.,
K4	CO4	To evaluate the basic and advanced problems in the field of electromagnetic theory

Mapping

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

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

Programme Code:	BSc	Programme Title:	Bachelor of Science		
Course Code:	20UPS3N1	**Title**		Batch:	2020-2023
		Non-Major Elective I: Principles of Physics – I		Semester:	III
Hrs/Week:	1			Credits:	2

Course Objective

- To create awareness and to develop basic skills about environment, energy resources and its application

Course outcomes

K1	CO1	To acquire basic knowledge on renewable energy sources
K2	CO2	To get the idea about astrophysics and and the energy resources
K3	CO3	To implement the environmental impacts on the concepts of physics
K4	CO4	To effectively use energy sources based on the required applications

Mapping

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

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

Programme Code:	BSc	Programme Title:	Bachelor of Science	
Course Code:	19UPS3N2	**Title**	**Batch:**	2019-2022
		Non-Major Elective I: Renewable Energy Sources	**Semester:**	III
Hrs/Week:	1		**Credits:**	2

Course Objective

- To develop the basic skills about various energy resources and its applications

Course outcomes

K1	CO1	To understand the Fundamental concept of various energy resources
K2	CO2	To implement the physical principles on the conventional and non-conventional sources to a device and its measurements.
K3	CO3	To harvest energy from various available sources

Mapping

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

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

Programme Code:	BSC	Programme Title:		Bachelor of Science	
Course Code:	19UPS406	**Title**		**Batch:**	2019-2022
		Core VI: Optics & Spectroscopy		**Semester:**	IV
Hrs/Week:	5			**Credits:**	5

Course Objective

- To understand the mechanism of energy transfer and to impart knowledge in electromagnetic spectrum

Course outcomes

K1	CO1	To gain knowledge about fundamental properties light, electromagnetic spectrum and splitting of spectral lines.
K2	CO2	To apply the energy transfer for absorption and emission spectra
K3	CO3	To determine structure of the molecules
K4	CO4	To evaluate bond angle and bond length etc.

Mapping

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

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

Programme Code:	BSC	Programme Title:		Bachelor of Science	
Course Code:	19UPS407	**Title**		**Batch:**	2019-2022
		Core VII: Physics Lab II		**Semester:**	III & IV
Hrs/Week:	3			**Credits:**	3

Course objective

- To understand the theory with hands-on experience.

Course outcomes

K3	CO1	Able to understand optics and electromagnetic field
K4	CO2	Able to determine earth's constant M & H
K5	CO3	Understanding the principles behind every experiments

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:	BSC	Programme Title:	Bachelor of Science		
Course Code:	20UPS4N3	**Title**		**Batch:**	2020-2023
		Non-Major Elective II: Principles of Physics –II		**Semester:**	IV
Hrs/Week:	1			**Credits:**	2

Course Objective

- To develop the scientific interests on the portable electronic devices for day to life

Course outcomes

K1	CO1	To recollect the basic knowledge about portable devices
K2	CO2	To understand the central concepts of electric and optical devices
K3	CO3	To apply the basic physical phenomena on the operating features of scientific devices
K4	CO4	To figure out the applications of the physical quantities

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Mapping

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

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

Programme Code:	BSC	Programme Title:		Bachelor of Science	
Course Code:	19UPS4N4	**Title**		**Batch:**	2019-2022
		Non-Major Elective II : Renewable Energy Sources Paper – II		**Semester:**	IV
Hrs/Week:	1			**Credits:**	2

Course Objective

- To enrich the fundamental scientific skills in inexhaustible sources of energies.

Course outcomes

K1	CO1	To recollect the various energy sources wind energy, bio mass energy and hydrogen energy
K2	CO2	To apply the basic physical concepts to develop the conversion technologies wet process, dry process and photosynthesis.
K3	CO3	To evaluate the influences of the energy sources on the scientific applications and its limitation.

Mapping

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

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

Programme Code:	BSC	**Programme Title:**	Bachelor of Science		
Course Code:	19UPS508	**Title**		**Batch:**	2019-2022
		Core VIII: Classical Dynamics		**Semester:**	V
Hrs/Week:	5			**Credits:**	5

Course Objective

- To understand the fundamental concepts in the dynamic of a particle and system of particles.

Course outcomes

K1	CO1	To recollect the mechanics of a particle
K2	CO2	To define and demonstrate knowledge of the different formalisms in classical dynamics of a system
K3	CO3	To apply these formalisms to obtain equations of motion for simple systems
K4	CO4	To represent these formalisms for mechanical systems

Programme code:	BSC	Programme Title :		Bachelor of Science	
Course Code:	19UPS509	**Title**		**Batch :**	2019-2022
		Core IX: Relativity & Quantum Mechanics		**Semester**	V
Hrs/Week:	5			**Credits:**	5

Course Objective

- To develop the skill to gain knowledge in Relativity & Quantum Mechanics

Course Outcomes

K1	CO1	To keep in mind the concepts and the consequences of special and general theory of relativity
K2	CO2	To understand the basic concepts of Quantum theory and the wave properties of particles
K3	CO3	To apply the wave equation to solve simple problems
K4	CO4	To interpret the different types of quantum numbers

Mapping

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

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

Programme Code:	BSC	Programme Title:		Bachelor of Science	
Course Code:	19UPS510	**Title**		**Batch:**	2019-2022
		Major Elective I: Basic Electronics & Circuit System		**Semester:**	V
Hrs/Week:	5			**Credits:**	5

Course Objective

- To understand the basic concepts of electronics and to implement the electronic circuits to various industrial applications

Course outcomes

K1	CO1	To recollect the fundamental concepts and developments of electronics
K2	CO2	To understand the construction and operations of semiconductor devices
K3	CO3	To apply the knowledge of basic theorems in analog circuits
K4	CO4	To design electronic and optoelectronic circuits and interpret the output

Mapping

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

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

Programme Code:	BSC	Programme Title:		Bachelor of Science	
Course Code:	19UPS511	**Title**		**Batch:**	2019-2022
		Major Elective II: Digital Circuit systems		**Semester:**	V
Hrs/Week:	5			**Credits:**	5

Course objective

- To study the number system, Logic circuits and its application and to understand the architecture and instruction set of 8085 microprocessor

Course outcomes

K2	CO1	Understanding the operations of BCD numbers and memory allocation in computers
K5	CO2	Develop effective problem solving abilities
K4	CO3	Analyze electronic circuits
K3	CO4	Apply the concept of basic electronic devices to design various circuits

Mapping

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

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

Programme Code:	BSC	Programme Title:		Bachelor of Science	
Course Code:	19UPS5S3	**Title**		**Batch:**	2019-2022
		Skill based Elective III: Mechanical Measurements		**Semester:**	V
Hrs/Week:	1			**Credits:**	2

Course Objective

- To enrich the basic foundation and inspire interest for the knowledge in Mechanical measurements

Course outcomes

K1	CO1	To understand the operational features, limitations and difficulties inherent in the instruments
K2	CO2	To apply the basic principle to develop the mechanical measurement systems
K3	CO3	To implement the operation and construction to infer the instrument characteristics
K4	CO4	To evaluate the accuracy, error and calibration of an instrument

Mapping

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

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

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Programme Code:	BSC	Programme Title:	Bachelor of Science		
Course Code:	19UPS5S4	**Title**		**Batch:**	2019-2022
		Skill based Elective IV: Fundamentals of Biophysics		**Semester:**	V
Hrs/Week:	1			**Credits:**	2

Course Objective

- To develop the basic knowledge about Biophysics and its Applications

Course outcomes

K1	CO1	To understand the physical principles of the biological phenomena.
K2	CO2	To apply the separation and physico-chemical techniques to study biological structure
K3	CO3	To implement the characteristics of a biological system using the concept of physics and chemistry
K4	CO4	To evaluate the physical and chemical properties of biological applications

Mapping

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

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

Programme Code:	BSC	Programme Title:		Bachelor of Science	
Course Code:	19UPS612	**Title**		**Batch:**	2019-2022
		Core X: Mathematical Physics		**Semester:**	VI
Hrs/Week:	5			**Credits:**	5

Course objective

- To apply the concepts of Mathematics in Physics and to acquire the basic knowledge about mathematical methods

Course outcomes

K1	CO1	To enrich the knowledge about mathematical concepts in Physics
K4	CO2	Able to relate mathematics and physics to understand nature
K3	CO3	Able to apply skills of mathematical modeling in applied fields
K3	CO4	To implement numerical methods in research fields

Mapping

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

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

Programme Code:	BSC	Programme Title:	Bachelor of Science	
Course Code:	19UPS613	**Title**	**Batch:**	2019-2022
		Core XI: Atomic & Nuclear Physics	**Semester:**	VI
Hrs/Week:	5		**Credits:**	5

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Course Objective

- To understand the structure and properties of electron and the nucleus

Course outcomes

K1	CO1	Develop understanding about the electronic and nuclear structure of atoms
K2	CO2	Appreciate the influence of X-rays, atomic and nuclear physics on modern scientific developments
K3	CO3	Analyze the key areas in which atomic and nuclear physics affects our everyday living
K4	CO4	Apply various tools and techniques to examine and understand the processes within material industry and medical applications of nuclear phenomena

Mapping

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

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

Programme Code:	BSC	Programme Title:	Bachelor of Science	
Course Code:	19UPS614	**Title**	**Batch:**	2019-2022
		Core XII: Condensed Matter Physics & Statistical Mechanics	**Semester:**	VI
Hrs/Week:	5		**Credits:**	5

Course objective

- To understand the electrical and magnetic properties of solids through classical and quantum statistics

Course outcomes

K1	CO1	Have knowledge of general structure, characteristics and behavior of matter in whichever phase they are in
K2	CO2	Have knowledge of effect of external application of force and torque and also understanding the underlying theory in it
K3	CO3	To find the application of above mentioned behavior in innovative research work
K4	CO4	Realize the conceptual understanding of the facts through implications of Quantum statistical concept.

Mapping

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

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

Programme code:	BSC	Programme Title :		Bachelor of Science	
Course Code:	19UPS615	**Title**		**Batch :**	2019-2022
		Microprocessor Mechanisms & Programming in C		**Semester**	VI
Hrs/Week:	5			**Credits:**	5

Course Objective

To develop the skill to gain knowledge in Programming in C & Information Security

Course Outcomes (CO)

K1	CO1	To remember the basic concepts of C programming language
K2	CO2	To understand the role of control statements in C
K3	CO3	To apply the concept of functions,structures and pointers in C

K4	CO4	To apply the knowledge of various instruction set of the Microprocessor Intel 8085 in solving simple programmes

Mapping

PSO/CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	S	H	S	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:	BSC	Programme Title:		Bachelor of Science	
Course Code:	19UPS616	Title		Batch:	2019-2022
		Core XIII: Electronics Lab		Semester:	V & VI
Hrs/Week:	3			Credits:	3

Course objective

- To provide a basic grounding in the field of Electronics and to serve as a hint for the student to the more advance techniques.

Course outcomes

K3	CO1	To gain knowledge of electronics
K4	CO2	To familiarize with the electronic circuits through experiment
K5	CO3	To understand the operation of amplifiers, oscillators etc

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:	BSC	Programme Title:	Bachelor of Science		
Course Code:	19UPS617	**Title**	Core XIV: Digital & Microprocessor Lab	**Batch:**	2019-2022
				Semester:	V & VI
Hrs/Week:	3			**Credits:**	3

Course Objective

- To be acquainted with the basics and working of Electronic Digital circuits and Microprocessor.

Course outcomes

K3	CO1	Determine the behavior of a digital logic circuit
K4	CO2	Translate the Boolean equations/expressions to efficient combinational and sequential circuits.
K5	CO3	Write simple programmes to run an 8085 microprocessor.

Mapping

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

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

Programme code:	BSC	**Programme Title :**	Bachelor of Science	
Course Code:	19UPS618	**Title**	**Batch :**	2019-2022
		Computer Lab in C	**Semester**	VI
Hrs/Week:	2		**Credits:**	2

Course Objective

- To develop the skill to gain knowledge in C

Course Outcomes (CO)

K3	CO1	To keep in mind the basics of C programming
K4	CO2	To understand and become familiar with C programs
K5	CO3	To verify the concepts through simple programs

Mapping

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

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

Programme Code:	BSC	**Programme Title:**	Bachelor of Science	
Course Code:	19UPS6S5	**Title**	**Batch:**	2019-2022
		Skill based Elective II: Environmental Instrumentation	**Semester:**	VI
Hrs/Week:	1		**Credits:**	2

Course Objective

- To get adequate knowledge in thermal measurements and to understand the operational features, limitations and difficulties faced in the instrumentation

Course outcomes

K1	CO1	Understand the design and operation of instruments for measurements of various environmental factors.
K2	CO2	Analyze the systems in terms of the functional model.
K3	CO3	Develop knowledge to select and use appropriate instrumentation to gather data under varying environmental conditions.
K4	CO4	Apply the technical and analytical skills for interpretation of environmental data

Mapping

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

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

Programme Code:	BSC	Programme Title:		Bachelor of Science	
Course Code:	19UPS6S6	Title	Batch:	2019-2022	
		Skill based Elective II: Fundamentals of Astrophysics	Semester:	VI	
Hrs/Week:	1		Credits:	2	

Course Objective

- To explore the basic knowledge and recent aspects of Space science, Quasars and Cosmology

Course outcomes

K1	CO1	To recollect the orgin and destiny of universe, astronomy, stars, quasars, cosmology etc.,
K2	CO2	To get the fundamental ideas of observational astronomy, stars, white dwarfs, nature of black holes and big bang theory.
K3	CO3	To implement the phenomena and processes associated with galaxy, stellar and formation of planetary systems, dark matter and energy
K4	CO4	To figure out the concept of red shift, expansion of universe, accelerating universe is essential for scientific and research applications

Mapping

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

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

Programme code:	BSc	Programme Title :	Bachelor of Science		
Course Code:	19 UMS 3A3 / 19 UCY 3A3	Title		Batch :	2019-2022
		Physics For Mathematics & Chemistry- I		Semester	III
Hrs/Week:	5			Credits:	4

Course Objective

- To develop the basic concepts of physics applied in chemistry and mathematics

Course outcomes

K1	CO1	To understand the basic concepts of physics in electricity, semiconductors, optics and digital electronics
K2	CO2	To differentiate analog and digital systems
K3	CO3	To gain an enhanced knowledge on number systems and logical expressions
K4	CO4	To convert the expressions into useful circuits

Mapping

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

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

Programme Code:	BSc	Programme Title:	Bachelor of Science		
Course Code:	19UMS4A4 / 19UCY4A4	**Title**		**Batch:**	2019-2022
		Physics For Mathematics & Chemistry- II		**Semester:**	IV
Hrs/Week:	5			**Credits:**	4

Course Objective

- To develop basic knowledge in the field of fiber optics, atomic, nuclear and quantum physics

Course outcomes

K1	CO1	To understand the structure of atom and Nucleus
K2	CO2	Gain a basic knowledge of Quantum physics and special theory of relativity
K3	CO3	To get an insight in to the field of laser and fiber optics
K4	CO4	To appreciate the beauty of physics

Mapping

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

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

Programme Code:	BSc	Programme Title:	Bachelor of Science		
Course Code:	19UMS4A5 / 19UCY4A5	**Title**		**Batch:**	2019-2022
		Physics Lab For Mathematics & Chemistry		**Semester:**	III & IV
Hrs/Week:	3			**Credits:**	4

Course Objective

- To enable the student to gain practical knowledge
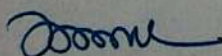
Course Outcomes

K3	CO1	To gain an in-depth knowledge and understanding of the functions of Potentiometer and Ballistic galvanometer
K4	CO2	To apply the concepts of physics on measurements and instrumentations of physical experiments
K5	CO3	To acquire enhanced practical skills in digital measurements

Mapping

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

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

HoD

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ProgrammeCode:	B.Sc.PHY			Programme Title:	BachelorofPhysics	
CourseCode:	21UPS101			Title	Batch:	2021-2024
				Core I:Properties ofMatter	Semester:	I
LectureHrs./Week	6	Tutorial Hrs./Sem.			Credits:	3

CourseObjective

Torecognizethebasic conceptsofgravitationandto getexposuretothepropertiesofliquidsand solids

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Gainknowledge andunderstandingofdynamicsandgravitation	K1/K2
CO2	Applyfundamentalconceptsontheapplicationsoftheelasticpropertiesofsolids	K3
CO3	Analyzethemoleculartheoryofsurfacetension,viscosityanddiffusion	K4
CO4	Evaluatethegeneraltermsinacousticslikeintensity,loudness,reverberationetc,andstudyindetailaboutproduction,detection,propertiesand uses of ultrasonicwaves	K5
CO5	Exploretheimpactofmatterproperties and gravitiononactualconcerns.	K5

Mapping

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

H-High;M-Medium;L-Low

Programme Code:	BSc	ProgrammeTitle:		BachelorofScience	
CourseCode:	21UPS202	Title		Batch:	2021-2024
		CoreII:ThermalPhysics		Semester:	II
Hrs/Week:	5			Credits:	5

CourseObjective

- Tounderstandofthe fundamentallawsandprinciplesofthermodynamicsandheat transfer

CO Number	COStatement	Knowledge Level
CO1	Acquiretheknowledgeaboutthefundamentallawsof thermodynamicsandprocurebasicknowledgeaboutrealgas,specific heat andentropy	K1/K2
CO2	Applythebasicprinciplesofheattransferandtheoryof gasesforvariousapplications	K3
CO3	Categorizethevariousthermodynamiccyclesusedfor energyproductions	K4
CO4	Enumeratethetheorybehindlowtemperaturephysicsandcompareatheworkingprinciples of variousliquefactionprocess	K5
CO5	Designinstrumentstoachievelowtemperatureenvironmentfor domesticapplicationsandinculcateprofessionalethicstosucceedevenindiversifiedsectors	K6

Mapping

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

ProgrammeCode:	B.Sc.PHY			Programme Title:	BachelorofPhysics	
CourseCode:	21UPS203			Title	Batch:	2020-2023
				Core III:PhysicsLa bI	Semester:	I& II
PracticalHrs./Week	3	Tutorial Hrs./Sem.	-		Credits:	3

CourseObjective

TodeveloptheskilltogainknowledgeinPhysicsLab

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understandthebasicprinciples inexecutingthe simpleexperiments	K2
CO2	Applythe knowledgeoftheoryto experiments	K3
CO3	Analyzetheexperimentresultswiththeory	K4
CO4	Evaluatedifferentphysicalparameterswithmaximum accuracy	K5
CO5	CreatevariousexperimentaltechniquestofindtheYoung'sModulus	K6

Mapping

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

H-High;M-Medium;L-Low

ProgrammeCode:	B.Sc.PHY		Programme Title:		BachelorofPhysics	
CourseCode:	21UPS304		**Title**		**Batch:**	2021 – 2024
			Core IV:Mathemat icalPhysics		**Semester:**	III
LectureHrs./Week	5	**TutorialHrs./Sem.**	-		**Credits:**	5

CourseObjective

ToapplytheconceptsofMathematicsin Physicsandto acquirethebasic knowledgeaboutmathematicalmethods

CourseOutcomes

Onthesuccessfulcompletion ofthecourse,students willbeable to

CO Number	COStatement	Knowledge Level
CO1	Gainknowledgeonthemathematicalconceptsof Physics	K1
CO2	Relatemathematicsandphysicstounderstand nature	K2
CO3	Applyskills of mathematical modelingin applied fields	K3
CO4	Implementnumericalmethodsinresearchfields	K4
CO5	Interpretmathematicstomanyprobleminphysicsparticularlyin researchArea.	K5

Mapping

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

H– High;M –Medium;L–Low

Programme Code:	BScPHY	ProgrammeTitle:	BachelorofScience		
CourseCode:	21UPS3N1	**Title** Non-MajorElectiveI: PrinciplesofPhysics –I	**Batch:**	2021-2024	
			Semester:	III	
Hrs/Week:	1		**Credits:**	2	

CourseObjective

- Tocreateawarenessand todevelopbasicskills aboutenvironment,energyresourcesanditsapplication

Courseoutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Rememberbasicknowledgeon renewable energysources	K1/K2
CO2	Applytheconceptsof Physicstoconstructdevices	K3
CO3	Analyzethe environmentalimpactsusingthecore conceptsofPhysics	K4
CO4	Createenergydevicesbasedonthe requiredapplications	K5
CO5	Design, construct, evaluate and troubleshoot the appliances using theacquiredknowledge	K6

Mapping

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

H– High;M –Medium;L–Low

ProgrammeCode:	BSc	ProgrammeTitle:	BachelorofScience		
CourseCode:	21UPS3N2	Title	Batch:	2021-2024	
		Non-Major Elective I:RenewableEnergySources-I	Semester:	III	
Hrs/Week:	1		Credits:	2	

CourseObjective

- Todevelop thebasic skillsabout various energyresourcesandits applications

Courseoutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Rememberthefundamentalconcept of variousenergyresources	K1/K2
CO2	Applythephysicalprinciplesofconventionalandnon-conventionalsources tostudythedeviceand makemeasurements.	K3
CO3	Analyze the harvested energy from various available sources and utilizeitbased on the requirements	K4
CO4	Createsolarrelateddevicesandmakemeasurements	K5
CO5	Designandconstructenergyrelateddevicesand applybasedontheavailableneeds	K6

Mapping

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

H-High;M-Medium;L-Low

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ProgrammeCode:	B.Sc.PHY		Programme Title:	BachelorofPhysics	
CourseCode:	21UPS405		Title	Batch:	2021 – 2024
			Core V:Electricity &Magnetis m	Semester:	IV
LectureHrs./Week or PracticalHrs./Week	5	TutorialHrs./Sem.	-	Credits:	5

CourseObjective

Tofamiliarizethestudentswiththefundamentalconceptsandlawsinelectricity&magnetismandestablishafoundationin electromagnetism

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Acquiretheknowledgeonfundamentalconceptsof electricandmagneticfields,potentials and electromagneticinduction	K1/ K2
CO2	Applyknowledgeofelectricityandmagnetismtoexplainnaturalphysicalprocesses and related technologicaladvances	K3
CO3	Analyzetheproblemsinelectromagnetismthatestablishestheconceptualunderstan ding	K4
CO4	Evaluatethebasicandadvancedproblemsinthefieldofstaticanddynamicfields	K5
CO5	Designexperimentsandacquiredatainordertoexplorephysicalprinciples, effectivelycommunicateresults,andcriticallyevaluaterelatedscientificstudies	K6

Mapping

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

H–High; M –Medium;L–Low

Programme Code:	BScPHY	ProgrammeTitle:		BachelorofScience	
CourseCode:	21UPS4N3	**Title**		**Batch:**	2021 -2024
		Non-MajorElectiveII: PrinciplesofPhysics–II		**Semester:**	IV
Hrs/Week:	1			**Credits:**	2

CourseObjective

Todevelopthescientificinterestsontheportable electronicdevicesfordaytolife

Courseoutcomes

Onthesuccessfulcompletion of thecourse, students willbeable to

CO Number	COStatement	Knowledge Level
CO1	Rememberthebasic knowledgeabout portabledevices	K1/K2
CO2	Applythe central conceptsofelectricandoptical devices	K3
CO3	Analyze the basic physical phenomena on the operating features ofscientificdevices	K4
CO4	Evaluatetheapplicationsofthephysicalquantities	K5
CO5	Createequipmentformeasuring	K6

Mapping

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

H– High;M – Medium;L– Low

Programme Code:	BScPHY	ProgrammeTitle:		BachelorofScience	
CourseCode:	21UPS4N4	**Title**		**Batch:**	2021 -2024
		Non-MajorElectiveII: RenewableEnergySources- II		**Semester:**	IV
Hrs/Week:	1			**Credits:**	2

CourseObjective

Toenrichthefundamentalscientificskillsininexhaustiblesourcesof energies

Courseoutcomes

Onthesuccessful completionofthecourse, studentswill ableto

CO Number	COStatement	Knowledge Level
CO1	Remember and understand various energy sources like windenergy,bio mass energyandhydrogenenergy	K1/K2
CO2	Applythebasicphysical conceptstodevelopdevicesbasedontheconversion technologies	K3
CO3	Analyzethedifferent formsof energyutilizingthebasicconceptsforvarious applications	K4
CO4	Designanddevelop thevariousenergyrelateddevices	K5
CO5	Evaluateandmakemeasurementsoftheconstructed devices	K6

Mapping

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

H-High;M-Medium;L-Low

Programme Code:	BScPHY	ProgrammeTitle:		BachelorofScience	
CourseCode:	21UPS406	Title		Batch:	2021-2024
		CoreVI:Physics Lab II		Semester:	III& IV
Hrs/Week:	3			Credits:	3

Courseobjective

- Tounderstand the theorywith hands-on experience.

CO Number	COStatement	Knowledge Level
CO1	Understandthebasicprinciplesofopticsandelectromagneticfield	K1/K2
CO2	Applytheknowledgeoffundamentalsofphysics toexecuteexperimentsand togetappropriate results	K3
CO3	Analysethetheoryofopticsand electromagneticfield byverifyingwith obtained data	K4
CO4	Calibratethedevicesusingerror correction methods	K5
CO5	Designinstrumentsbyusingtheprinciplesbehindevery experiment and develop skills to workcollectively	K6

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

ProgrammeCode:	B.Sc.PHY		Programme Title:	BachelorofScience	
CourseCode:	21UPS507		Title	Batch:	2021 – 2024
			Core	Semester:	V
LectureHrs./Week	5	TutorialHrs./Sem.	VII: Mechanics	Credits:	5

CourseObjective

Toacquireacompleteknowledgeaboutmechanicsandclassicaldynamics

CourseOutcomes

Onthesuccessfulcompletion ofthecourse, studentswillbeableto

CO Number	COStatement	Knowledge Level
CO1	UnderstandthelawsinvolvedinProjectiles,Rigidbodydynamicsandclassical mechanics	K1
CO2	Gain a deeper insight into the physical concepts and its applicationtovarious physical systems	K2
CO3	Applytheseformalismstoobtainequationsofmotionforsimplesystems	K3
CO4	Analyzetheproblemand frame equationsofmotion	K4
CO5	Ability to Use the necessary skills andtoolsto write equations forrealtimeproblems	K5

Mapping

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

H–High; M –Medium;L–Low

ProgrammeCode:	B.Sc.PHY		Programme Title:	BachelorofScience	
CourseCode:	21UPS508		Title	Batch:	2021 – 2024
			CoreIX: Optics &Spectroscopy	Semester:	V
LectureHrs./Week	5	TutorialHrs./Sem.	-	Credits:	5

CourseObjective

Tounderstandthe mechanismofenergytransfer andto impartknowledgeinelectromagneticspectrum

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Demonstrate the characteristics of light and interaction of electromagneticradiationswithmatter	K1
CO2	Applytheprincipleofatomicandmolecularspectroscopyin identificationofproperties ofmaterialsandapplications	K2
CO3	Categorizethespectrafromvibrationalandrotational motionof atomsormolecules	K3
CO4	Explainthe theoretical models ofspectroscopythat aresuitablefor eachphenomenarelated toradiations	K4
CO5	Plananddesigntheinstrumentsbasedonelectromagneticradiations byusingthetools andmethodologies of spectroscopy	K5

Mapping

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

H–High; M–Medium;L–Low

ProgrammeCode:	B.Sc.PHY			Programme Title:		BachelorofPhysics	
CourseCode:	21UPS509			**Title**		**Batch:**	2021 – 2024
				Core VIII:Relativity &Quantum Mechanics		**Semester:**	VI
LectureHrs./Week or PracticalHrs./Week	5	**TutorialHrs./Sem.**	65			**Credits:**	5

CourseObjective

Todeveloptheskillto gainknowledgein Relativity& QuantumMechanics

CourseOutcomes

Onthesuccessfulcompletion ofthecourse,students willbeable to

CO Number	COStatement	Knowledge Level
CO1	Understandthelimitationsofclassicalmechanics andacquiretheknowledgeof Wavenatureofmatter	K1/K2
CO2	Illustrate Heisenberguncertaintyprinciple andobtainthewave equation for timedependentandtimeindependentsystems	K3
CO3	Analyzethe wave equationanduseittosolvephysicalproblems	K4
CO4	EstablishSchrodingerequationforhydrogenatomandoutlinethesignificance ofQuantumnumbers	K5
CO5	Understandtheconcepts andconsequences of special theoryofrelativity	K6

Mapping

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

H– High;M –Medium; L–Low

ProgrammeCode:	B.Sc.PHY		Programme Title:		BachelorofPhysics	
CourseCode:	21UPS5E10		Title	**Batch:**	2021 – 2024	
			Core Elective - I :Basic Electronics&CircuitSystem	**Semester:**	V	
LectureHrs./Week or PracticalHrs./Week	5	TutorialHrs./Sem.	-		**Credits:**	5

CourseObjective

Toprovidefundamentalskilltoanalyzeelectroniccircuitsystemsandintroducebasicsemiconductordevices,theircharacteristics, operations and applications

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understand the fundamental concepts ofelectroniccircuits with semiconductordevices	K1/ K2
CO2	ApplytheknowledgeofcircuitstoinvestigatePNjunctionsinsemiconductordevices under various conditions	K3
CO3	Demonstratefamiliarity withbasicelectroniccomponentsandusethemtodesignsimpleelectroniccircuits	K4
CO4	Recognizeavarietyofexcitinghigh-techproductsandsystemsenabledbyelectronics	K5
CO5	Design,developandsimulatethenewelectroniccircuitsforapplicationsinvariousfields	K6

Mapping

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

H–High; M –Medium;L–Low

ProgrammeCode:	B.Sc.PHY		Programme Title:		BachelorofPhysics	
CourseCode:		43	Title	**Batch:**	2021 – 2024	

	21UPS5E11		Core Elective I:Communicati onElectronics	Semester:	V
LectureHrs./Week or PracticalHrs./Week	5	**TutorialHrs./Sem.**	-	**Credits:**	5

CourseObjective

To provide fundamentalknowledgeofdigitalmodulationtechniqueswiththeconceptsof communicationsystemandtheirapplications

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understandthefundamentaltheoriesofelectronicsystemsinvolvedincommunicati on	K1/ K2
CO2	Applytheknowledgeofmathematicalmethodstoresolvethecomponentsofdigitalco mmunication system	K3
CO3	Analyzebasicwirelesstransmissioncircuitsusingelectronicdevicesandinstrument s	K4
CO4	Explainclearlytheimportanceoftransformationequationstoconvertsignalsfromon edomain to anotherin thefield ofdigitalcommunication	K5
CO5	Designandanalyzetheelectroniccircuitsystemsthatareresponsiblefordigitaltrans mission usingvarious simulation techniques	K6

Mapping

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

H–High; M –Medium;L–Low

ProgrammeCode:	B.Sc.PHY			Programme Title:	BachelorofPhysics	
CourseCode:	21UPS5E12			**Title**	**Batch:**	2021 – 2024
					Semester:	V
LectureHrs./Week or PracticalHrs./Week	5	**TutorialHrs./Sem.**		Materials Science	**Credits:**	5

CourseObjective

Toacquirebasic knowledgeofatomic structureandbindingconditionsof atom inthematerials.

To acquireenvelopingknowledgeofphysics,chemistry,metallurgyandmathematicstoknowwider fieldofmaterials science

Toprovokethe studentsto pursueresearch inthefieldofmaterialsscience.

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understandthephysicsbehindthematerialformationanddifferentproper tiesofthe solids.	K1,K2
CO2	Tailorthepropertiesofsolidsmaterialswiththeadequateknowledge.	K3
CO3	Developanew materialsbasedonthefundamentalunderstandingoftheproperties	K3
CO4	Evaluatethematerialspropertiesforthecutting-edge applications	K4
CO5	Designandanalysistheexperimental/materialsstrategies	K5

Mapping

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

H-High;M-Medium;L-Low;

ProgrammeCode:	B.Sc.PHY		Programme Title:	BachelorofScience	
CourseCode:	21UPS5AL1		Title	Batch:	2021 – 2024
			AdvancedLearnerCourse - I - ProblemSolvingSkills inPhysicsI	Semester:	V
LectureHrs./Week	TutorialHrs./Sem.			Credits:	5

CourseObjective

Studentwillbe introducedto solveproblems incorephysics.Everyunitmust containminimum 20problemsbasedon various principles of Physics.

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Getmotivatedto acquireproblem solvingskills inPhysics	K1/K2
CO2	ApplytheskillstosolveinMechanics,ThermalPhysicsand Electricity	K3
CO3	Selectanduseappropriateconceptsandmethodstosolve problemseffectivelyandcreatively	K4
CO4	Identify,evaluateandsynthesizeinformationandengagethe imaginationtoexplorenewpossibilities	K5
CO5	Crackproblemsconfidentlyincompetitiveexaminationslike JEST,JAM&TIFR	K6

Mapping

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

H–High; M –Medium;L–Low

ProgrammeCode:	B.Sc.PHY		Programme Title:		BachelorofPhysics
CourseCode:	21UPS5S1		Title	Batch:	2021 – 2024
			Skill basedElective I:Mechanical Measurements	Semester:	V
LectureHrs./Week or PracticalHrs./Week	1	TutorialHrs./Sem. -		Credits:	3

CourseObjective

Toenrichthebasicfoundation andinspireinterest fortheknowledgein Mechanicalmeasurements

CourseOutcomes

Onthesuccessfulcompletion ofthecourse,students willbeable to

CO Number	COStatement	Knowledge Level
CO1	Understandtheoperationalfeatures,limitationsanddifficultiesinherentintheinstruments	K2
CO2	Classifyand select propermeasuringinstrument forpressureand flow measurement	K3
CO3	Implementtheoperationandconstructiontoinfertheinstrument characteristics	K4
CO4	Evaluatetheaccuracy,errorand calibrationofaninstrument	K5
CO5	Design andusesimpleinstrumentationforameasurementofmechanical properties.	K6

Mapping

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

H– High;M –Medium;L–Low

ProgrammeCode:	B.Sc.PHY		Programme Title:		BachelorofPhysics
CourseCode:	21UPS5S2		Title	Batch:	2021 – 2024
			Skill basedElective I:Fundamentals of Biophysics	Semester:	V
LectureHrs./Week or PracticalHrs./Week	1	TutorialHrs./Sem.	-	Credits:	3

CourseObjective

TodevelopthebasicknowledgeaboutBiophysicsanditsApplications

CourseOutcomes

Onthesuccessfulcompletion ofthecourse,students willbeable to

CO Number	COStatement	Knowledge Level
CO1	Acquirethe knowledgeonthe keyprinciples ofphysics toward evaluatingandanalyzingthe biologicalphenomenon.	K2
CO2	Applythe separation and physico-chemical techniques to studybiological Structure	K3
CO3	Implementthe characteristicsofabiologicalsystemusingtheconceptof physicsandchemistry	K4
CO4	Explainthetechniques andunderlyingconcept ofphysics ofBiomechanics and Neuro-Biophysics	K4
CO5	Evaluatethephysicalandchemicalpropertiesofbiologicalapplications	K5

Mapping

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

H– High;M –Medium; L–Low

ProgrammeCode:	B.Sc.PHY		Programme Title:	BachelorofPhysics	
CourseCode:	21UPS614		Title	Batch:	2021 -2024
			Core X: Atomic& NuclearPhysics	Semester:	VI
LectureHrs./Week or PracticalHrs./Week	5	Tutorial Hrs./Sem.		Credits:	5

CourseObjective

Tocomprehendthestructureand propertiesofelectronandthenucleus

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Acquirefundamentalknowledgeabouttheelectronicandnuclearstructureof atoms	K1
CO2	UnderstandtheinfluenceofX-rays,atomicandnuclearphysicsonmodernscientificdevelopments	K2
CO3	Applythekeystrategiestoinvestigatetheatomicandnuclearphysicsaffects our everydayliving	K3
CO4	Analyzetechniquestoexamineandunderstandtheprocesseswithinmaterial industryand medicalapplications ofnuclear phenomena	K4
CO5	Evaluatepropertiesofelementaryparticles,associatedsymmetries,con servationsand models	K5

Mapping

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

H-High;M-Medium;L-Low

ProgrammeCode:	B.Sc.PHY		Programme Title:	BachelorofPhysics	
CourseCode:	21UPS615		Title	Batch:	2021 -2024
			Core XI: SolidStatePhysics&StatisticalMechanics	Semester:	VI
LectureHrs./Week or PracticalHrs./Week	5	Tutorial Hrs./Sem.		Credits:	5

CourseObjective

Tostudythebasictheoryofcrystalstructure,compositionand physicalpropertiesofcrystalline materials.

Studytheelectrical andmagneticproperties ofsolids through classical andquantum statistics

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understand the basic structural parameters, characteristics andbehaviorofmatter in whichever phasetheyarein	K1/K2
CO2	Applytheoreticalinsightsontheexternalapplicationofforceandtorqueand also understandingthe underlyingtheoryin it	K3
CO3	Analyze the conceptual understanding of the facts through implicationsofQuantum statistical concept.	K4
CO4	Evaluatetheapplicationaspectsofabove-mentionedbehaviorininnovativeresearch work	K5
CO5	Createexperimentalinsightsintomaterialdesign andpropertyevaluationusing classicaland quantum principles	K6

Mapping

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

H-High;M-Medium;L-Low

ProgrammeCode:	B.Sc.PHY	Programme Title:	BachelorofPhysics	
CourseCode:	21UPS6E16	**Title**	**Batch:**	2021 – 2024
		CoreElectiveII: Digital Circuitsystems &Microprocessor	**Semester:**	VI
LectureHrs./Week or PracticalHrs./Week	5	TutorialHrs./Sem. -	**Credits:**	5

CourseObjective

Tostudythenumbersystem,Logic
circuitsanditsapplicationandtounderstandthearchitectureandinstructionset of 8085 microprocessor

CourseOutcomes

Onthesuccessfulcompletion ofthecourse,students willbeableto

CO Number	COStatement	Knowledge Level
CO1	Understandingtheoperationsof BCDnumbers and memoryallocationincomputers	K2
CO2	Developeffectiveproblemsolvingabilities	K3
CO3	Analyzeelectroniccircuits	K4
CO4	Applythe conceptof basicelectronicdevicestodesignvariouscircuits	K5
CO5	UnderstandandtoimplementdigitalelectronicsandMicroprocessor.	K6

Mapping

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

H– High;M –Medium;L–Low

ProgrammeCode:	B.Sc.PHY		Programme Title:	BachelorofScience	
CourseCode:	21UPS6E17		Title	Batch:	2021 – 2024
			CoreElective II: BiomedicalI nstrumentati on	Semester:	VI
LectureHrs./Week	5	TutorialHrs./Sem.	-	Credits:	5

CourseObjective

Tofamiliarizewiththeuseofmedicalinstruments andgaintheknowledgeinoperationofmodern biomedicalinstruments

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Recallthestructureofcell,physiologyofdifferentbiological systemsandtheir functions.	K1
CO2	Illustratethetypesofelectrodesandmeasurementsofbiological parameters.	K2
CO3	Explain the working of diagnostic instruments, therapeutic instrumentsandimagingsystems.	K3
CO4	Analysethedifferentmethodsofmeasurementsofbiological parameters.	K4
CO5	Comparethedifferenttechniquesofmeasurementinmedicalfield.	K5

Mapping

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

H–High; M–Medium;L–Low

ProgrammeCode:	B.Sc.PHY	Programme Title:	BachelorofPhysics		
CourseCode:	21UPS6E18	Title	Batch:	2021 – 2024	
		CoreElective II : Nanomaterialsa ndapplications	Semester:	VI	
LectureHrs./Week or PracticalHrs./Week	5	Tutorial Hrs./Sem.		Credits:	5

CourseObjective

TolayfoundationofNanoscience andNanotechnology.
Toprovidethefundamentalknowledgeofnanomaterials,theirsynthesisandfabrication,propertiesandapplications.
Toprovokethe studentsto pursueresearch in thefield ofnanomaterials

CourseOutcomes

Onthesuccessful completionofthe course, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understandthe fundamentalofnanomaterialsandnanotechnology	K1,K2
CO2	Synthesizenanomaterialsusingvariousphysicalandchemicalmethods	K3
CO3	Tunethe sizeand shapeofthe nanomaterials fordiverseapplications	K4
CO4	Evaluatethepropertiesofnanomaterialsanddefectsnatureofthematerials	K4
CO5	Designnanomaterials-baseddevicesandanalysis theirperformance	K4,K5

Mapping

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

H-High;M-Medium;L-Low

Designedby	Verifiedby HOD	CheckedbyCDC	Approvedby COE

ProgrammeCode:		B.Sc.PHY	Programme Title:	BachelorofPhysics	
CourseCode:		21UPS6E19	Title	Batch:	2021 – 2024
			Core Elective III:CProgramming &InformationSecurity	Semester:	VI
LectureHrs./Week orPracticalHrs./Week	5	TutorialHrs./Sem.		Credits:	5

CourseObjective

Todeveloptheskilltogain knowledgeinProgramminginC &InformationSecurity

CourseOutcomes

Onthesuccessfulcompletion ofthecourse,students willbeable to

CO Number	COStatement	Knowledge Level
CO1	Understandthebasicconcepts ofCprogrammingandinformationsecurity	K1/K2
CO2	Applythe conceptsof Cprogrammingtosolve problemsinPhysics	K3
CO3	Analyzetheimportance ofoperators,controlstatements,functions,structures andpointers in problem solving	K4
CO4	Evaluatetheimpactofvarioustypesof attacksoninformationleakageandsecurity	K5
CO5	Create the advance perspectives on prevention through cyber-crime of wirelessdigitalcommunications includinginternet and e-commerce	K6

Mapping

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

H– High;M –Medium; L–Low

ProgrammeCode:	B.Sc.PHY		Programme Title:	BachelorofScience	
CourseCode:	21UPS6E20		Title	Batch:	2021 – 2024
			CoreElective III: IndustrialInstrumentation	Semester:	VI
LectureHrs./Week	5	TutorialHrs./Sem. -		Credits:	5

CourseObjective

Tomakethestudentfamiliarwithmeasurement techniquesof physicalquantitiesandanalyzethe data

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understandtheprinciplesofinstrumentsusedindifferentindustrial sectors	K1
CO2	Elucidatetheconstructionandworkingofvariousindustrialdevices inmeasuringphysicalquantities	K2
CO3	Analyzetheperformanceandcharacteristicsofeachinstrument	K3
CO4	Makethenew modelsforcalibrationandconfiguration of instruments	K4
CO5	Formulatetheinstrumentsforspecific applicationsinindustries	K5

Mapping

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

H–High; M–Medium;L–Low

ProgrammeCode:	B.Sc.PHY		Programme Title:		BachelorofPhysics	
CourseCode:	21UPS6E21		Title		Batch:	2021 – 2024
			CoreElectiveIII: PythonProgramming		Semester:	VI
LectureHrs./Week or PracticalHrs./Week	5	TutorialHrs./Sem.	-		Credits:	5

CourseObjective

ToprovidefundamentalknowledgeofPythonprogrammingandcreatetheabilitytointerpretphysicsorientedproblems usingPython

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understandthebasics,structureandfunctionsof Pythonprogrammingasusefulscriptinglanguage	K1/ K2
CO2	Plantowritethealgorithmofaprogramwiththeknowledgeofmathematicaloperators ,logical operators, conditionaland loopingstatements	K3
CO3	CategorizevariousstatementsofPythonprogrammingintothelistsandtuples	K4
CO4	Explainclearlytheimportanceofdifferentfunctionstatementsandpasstheargument sbetween functions	K5
CO5	ImplementandcompilethepythonprogrammingforapplicationinthefieldofPhysics	K6

Mapping

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

H–High; M –Medium;L–Low

ProgrammeCode:	B.Sc.PHY		Programme Title:	BachelorofScience	
CourseCode:	21UPS6AL2		Title	Batch:	2021 – 2024
			AdvancedLearnerCourse -II -ProblemSolvingSkills inPhysicsII	Semester:	VI
LectureHrs./Week		TutorialHrs./Sem.		Credits:	5

CourseObjective

Studentwill beintroduced to solveproblems in corephysics. Everyunit must contain minimum 20problemsbasedon various principles of Physics.

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Getmotivatedtoacquire problemsolvingskills inPhysics	K1/K2
CO2	ApplytheskillstosolveinMagnetism,QuantumMechanics,General Physicsetc	K3
CO3	Selectanduseappropriateconceptsandmethodstosolveproblemseffectivelyandcreatively	K4
CO4	Interpret and use written, quantitative, and visual texteffectivelyin presentation of solutions to problems	K5
CO5	CrackproblemsconfidentlyincompetitiveexaminationslikeJEST,JAM &TIFR	K6

Mapping

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

H–High; M –Medium;L–Low

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ProgrammeCode:	B.Sc.PHY			Programme Title:		BachelorofPhysics	
CourseCode:	21UPS6S3			**Title**		**Batch:**	2021 – 2024
				Skill basedElective II:Environment alInstrumentati on		**Semester:**	VI
LectureHrs./Week or PracticalHrs./Week	1	**TutorialHrs./Sem.**	-			**Credits:**	2

CourseObjective

Togetadequateknowledgeinthermalmeasurementsandtounderstandtheoperationalfeatures,limitationsand difficultiesfaced inthe instrumentation

CourseOutcomes

Onthesuccessfulcompletion ofthecourse,students willbeable to

CO Number	COStatement	Knowledge Level
CO1	Usetheconceptofmeasurement	K1
CO2	Understandthedesignandoperationofinstrumentsformeasurementsof variousenvironmentalfactors.	K2
CO3	Useadequateequipmenttodeterminethe stateof pollutionintheenvironment	K3
CO4	Applythetechnicalandanalyticalskillforinterpretationofenvironmentaldata	K4
CO5	Understandthe livingconditionsin industrial areas	K5

Mapping

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

H– High;M –Medium; L–Low

ProgrammeCode:	B.Sc.PHY		Programme Title:		BachelorofPhysics	
CourseCode:	21UPS6S4		Title	Batch:	2021 – 2024	
			Skill basedElective II:Fundamentals ofAstrophysics	Semester:	VI	
LectureHrs./Week or PracticalHrs./Week	1	TutorialHrs./Sem.	-		Credits:	2

CourseObjective

ToexplorethebasicknowledgeandrecentaspectsofSpacescience,Quasars andCosmology

CourseOutcomes

Onthesuccessfulcompletion ofthecourse,students willbeable to

CO Number	COStatement	Knowledge Level
CO1	Recollecttheoriginand destinyofuniverse,astronomy,stars,quasars,cosmology	K1
CO2	Acquirethe fundamental ideasofobservationalastronomy,stars,whitedwarfs, natureof black holes andbigbangtheory	K2
CO3	Implementthephenomenaandprocessesassociatedwithgalaxy,stellar and formationofplanetarysystems,dark matterandenergy	K3
CO4	Figureout theconcept ofredshift, expansionofuniverse,acceleratinguniverse isessentialforscientificandresearch applications	K4
CO5	Elucidatetheoriginofuniverseandvariousmodelsbasedon cosmological principles	K5

Mapping

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

H– High;M –Medium; L–Low

Programme Code:	BScPHY	ProgrammeTitle:		BachelorofScience	
CourseCode:	21VAD601	Title		Batch:	2021 -2024
		ValueAddedCourse:Remote SensingandDataFusionusingIoT		Semester:	VI
TotalHrs	30			Credits:	Grade

VALUE ADDED PROGRAM

S.no	Remote Sensing and Data Fusion using IoT- Syllabus	Modules
1	Introduction to Sensors - Introduction to Data Acquisition System : IoT - Introduction to Sensors Integration - Vision Sensors Interface	Module 1
2	Humidity Sensor Interface - Temperature Interface - Pressure Sensor Interface - Water quality Sensor Interface - Moisture Sensor Interface	Module 2
3	Level Sensor Interface - Flow Sensor Interface - Gas Sensor Interface (Co2, Co, O2, Methane) - Tilt Sensor Interface	Module 3
4	Displacement Sensor Interface - – Position Sensor Interface - Motion Sensor Interface - Accelerometer Sensor Interface	Module 4
5	IoT Interface using IBM Cloud - IoT Launch - Real Time Sensing and Monitoring -RTC Interface	Module 5

Verifiedby HOD	CheckedbyCDC	Approvedby COE
Name: Dr.T.E.Manjulavalli Signature:	Name: Mr.K.Srinivasan Signature:	Name: Dr.R.ManickaChezianS ignature:

ProgrammeCode:	B.Sc.PHY		Programme Title:	BachelorofPhysics	
CourseCode:	21UPS622		Title	Batch:	2021 – 2024
			Core XII:Electronics Lab	Semester:	V&VI
LectureHrs./Week or PracticalHrs./Week	3	TutorialHrs./Sem.	-	Credits:	3

CourseObjective

ToprovideabasicknowledgeinthefieldofElectronicsand tofamiliarizetheiroperations

CourseOutcomes

Onthesuccessfulcompletion ofthecourse,students willbeable to

CO Number	COStatement	Knowledge Level
CO1	UnderstandthebasicprinciplesofElectronics	K1/K2
CO2	Applythe principlein circuitdesigning	K3
CO3	Analyzethe characteristicsoftransistor,FET and Op-amp	K4
CO4	Evaluatethe workingof Electronicdevices	K5
CO5	Designcircuitsandverifyitsoperation	K6

Mapping

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

H– High;M –Medium; L–Low

ProgrammeCode:	B.Sc.PHY		Programme Title:	BachelorofPhysics
CourseCode:	21UPS623		Title	Batch:	2021 – 2024
			Core XIII: Digital& MicroprocessorLab	Semester:	V &VI
LectureHrs./Week or PracticalHrs./Week	3	TutorialHrs./Sem.	-	Credits:	3

CourseObjective

Tobeacquainted withthe basicsandworkingofElectronicDigitalcircuits andMicroprocessor.

CourseOutcomes

Onthesuccessfulcompletion ofthecourse,students willbeable to

CO Number	COStatement	Knowledge Level
CO1	Understandtheworkingconditionsof logiccircuitsanditsapplications	K2
CO2	Constructanddemonstrateofflipflopanddigitalcircuits	K3
CO3	Determinethebehaviorofadigitallogiccircuit	K4
CO4	Translatethe Booleanequations/expressionstoefficientcombinationaland sequentialcircuits.	K5
CO5	Executesimpleprogrammesusing8085microprocessor	K5

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	H	H	M	H	M	H	H	M
CO2	H	H	M	H	M	H	H	-
CO3	H	M	M	H	L	H	H	M
CO4	M	H	M	H	L	H	M	M
HCO5	H	H	H	H	M	H	H	H

H– High;M –Medium;L–Low

ProgrammeCode:	B.Sc.PHY		Programme Title:	BachelorofScience	
CourseCode:	21UPS624		Title	Batch:	2021 – 2024
			CoreXIV: Computerlab in C	Semester:	VI
LectureHrs./Week	2	TutorialHrs./Sem.	-	Credits:	2

CourseObjective

Todeveloptheskillto gainknowledgein Clanguage

CourseOutcomes

Onthesuccessfulcompletion ofthecourse, students willbeable to

CO Number	COStatement	Knowledge Level
CO1	Understandandbecome familiarwithCprograms	K1
CO2	Applythestatements towritetheprograms	K2
CO3	DemonstratetheuseoffunctionsandargumentsinC language	K3
CO4	Explainthe conceptsof conditionaland loopingstatements	K4
CO5	Writenewprogramsfor applicationinvariousfieldofPhysics	K5

Mapping

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

H–High; M–Medium;L–Low

Programme Code:	BScPHY	ProgrammeTitle:	BachelorofScience		
CourseCode:	21UMS3A3/ 21UCY3A3	Title		Batch:	2021 -2024
		PhysicsforMathematics and Chemistry-I		Semester:	III
Hrs/Week:	5			Credits:	4

CourseObjective

Toacquiretheknowledgeinconceptsofappliedphysics

Courseoutcomes

CO Number	COStatement	Knowledge Level
CO1	Torememberthebasicprinciplesinmechanics	K1/K2
CO2	Toapplyknowledgein estimatingthe mechanicalparameters	K3
CO3	Toanalyzetheknowledgeinapplications	K4
CO4	Toevaluatetheprinciplesofphysicsinmathematicsandche mistry	K5
CO5	Tocreate adifferent types oflasers andfibersrelated this studies	K6

Mapping

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

H– High;M –Medium;L– Low

Programme code:	BScPHY	ProgrammeTitle:	BachelorofScience		
CourseCode:	21UMS 4A4 / 21UCY4 A4	**Title** PhysicsForMathematics &Chemistry-II	**Batch:**	2021 -2024	
			Semester	IV	
Hrs/Week:	5		**Credits:**	4	

CourseObjective

Todevelopthebasic conceptsofphysics appliedinchemistryandmathematics

Courseoutcomes

CO Number	COStatement	Knowledge Level
CO1	Torememberthebasicconceptsofphysicsinelectricity,semi conductors,optics anddigital electronics	K1/K2
CO2	Toapplyanalogand digitalsystems	K3
CO3	Toanalyzeknowledgeonnumbersystemsandlogicalexpressions	K4
CO4	Toevaluatethe expressionsintousefulcircuits	K5
CO5	Tocreatelogicgates circuits	K6

Mapping

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

H-High;M-Medium;L-Low

Programme Code:	BSc PHY	Programme Title:		Bachelor of Science	
Course Code:	21UMS4A5 / 21UCY4A5	Title	Batch:	2022 - 2025	
		Physics Lab For Mathematics & Chemistry	Semester:	III & IV	
Hrs/Week:	3		Credits:	4	

Course Objective

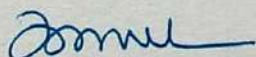To enable the student to gain practical knowledge in Physics instruments

Course Outcomes

CO Number	CO Statement	Knowledge Level
CO1	To remember depth knowledge in Elasticity of rigid materials	K1/K2
CO2	To analyze the concepts of physics on measurements and instrumentations of physical experiments	K3
CO3	To apply practical skills in analog and digital measurements	K4
CO4	To evaluate concepts of logic gates	K5
CO5	To create various logic gates using Ics	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	H	H	M	-	M	-	H	-
CO4	M	L	H	H	H	H	M	H

H-High; M-Medium; L-Low

HoD

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Programme Code:	B.Sc. PHY		Programme Title:		Bachelor of Physics	
Course Code:	22UPS101		Title		Batch:	2022 – 2025
			Core I: Gravitation, Properties of Matter and Sound		Semester:	I
Lecture Hrs./Week or Practical Hrs./Week	6	Tutorial Hrs./Sem.	-		Credits:	3

Course Objective

To recognize the basic concepts of gravitation and to get exposure to the properties of liquids and solids

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Gain knowledge and understandingof dynamics and gravitation	K1/K2
CO2	Apply fundamental concepts on the applications of the elastic properties of solids	K3
CO3	Analyze the molecular theory of surface tension, viscosity and diffusion	K4
CO4	Evaluate the general terms in acoustics like intensity, loudness, reverberation etc, and study in detail about production, detection, properties and uses of ultrasonic waves	K5
CO5	Explore the impact of matter properties and gravitation on actual concerns.	K5

Mapping

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

H – High; M – Medium; L – Low

Programme Code:	BSc	Programme Title:		Bachelor of Science	
Course Code:	22UPS202	Title		Batch:	2022-2025
		Core II: Thermal Physics		Semester:	II
Hrs/Week:	5			Credits:	5

CourseObjective

- To understand of the fundamental laws and principles of thermodynamics and heattransfer

CO Number	CO Statement	Knowledge Level
CO1	Acquire the knowledge about the fundamental laws of thermodynamics and procure basic knowledge about real gas, specific heat and entropy	K1/K2
CO2	Apply the basic principles of heat transfer and theory of gases for various applications	K3
CO3	Categorize the various thermodynamic cycles used for energy productions	K4
CO4	Enumerate the theory behind low temperature physics and compare the working principles of various liquefaction process	K5
CO5	Design instruments to achieve low temperature environment for domestic applications and inculcate professional ethics to succeed even in diversified sectors	K6

Mapping

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

Programme Code:	B.Sc. PHY			Programme Title:	Bachelor of Physics	
Course Code:	22UPS203			Title	Batch:	2020-2023
					Semester:	I & II
Practical Hrs./Week	3	Tutorial Hrs./Sem.	-	Core III: Physics Lab I	Credits:	3

Course Objective

To develop the skill to gain knowledge in Physics Lab

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic principles in executing the simple experiments	K2
CO2	Apply the knowledge of theory to experiments	K3
CO3	Analyze the experiment results with theory	K4
CO4	Evaluate different physical parameters with maximum accuracy	K5
CO5	Create various experimental techniques to find the Young's Modulus	K6

Mapping

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

H-High; M-Medium; L-Low

ProgrammeCode:	B.Sc.PHY			Programme Title:		BachelorofPhysics	
CourseCode:	22UPS304			**Title**	**Batch:**	2022 – 2025	
				Core IV: Mathematical Physics	**Semester:**	III	
LectureHrs./Week	5	**TutorialHrs./Sem.**	-		**Credits:**	5	

CourseObjective

To apply the concepts of Mathematics in Physics and to acquire the basic knowledge about mathematical methods

CourseOutcomes

Onthesuccessful completionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Gain knowledge on the mathematical concepts of Physics	K1
CO2	Relate mathematics and physics to understand nature	K2
CO3	Apply skills of mathematical modeling in applied fields	K3
CO4	Implement numerical methods in research fields	K4
CO5	Interpret mathematics to many problem in physics particularly in research Area.	K5

Mapping

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

H–High;M– Medium;L–Low

Programme Code:	BSc PHY	Programme Title:	Bachelor of Science		
Course Code:	22UPS3N1	**Title**		**Batch:**	2022-2025
		Non-Major Elective I: Principles of Physics – I		**Semester:**	III
Hrs/Week:	1			**Credits:**	2

Course Objective

- To create awareness and to develop basic skills about environment, energy resources and its application

Course outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember basic knowledge on renewable energy sources	K1/K2
CO2	Apply theconcepts of Physics to construct devices	K3
CO3	Analyze the environmental impacts using the core concepts of Physics	K4
CO4	Create energy devices based on the required applications	K5
CO5	Design, construct, evaluate and troubleshoot the appliances using the acquired knowledge	K6

Mapping

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

H – High; M – Medium; L – Low

Programme Code:	BSc	Programme Title:	Bachelor of Science		
Course Code:	22UPS3N2	**Title**	Non-Major Elective I: Renewable Energy Sources-I	**Batch:**	2022-2025
				Semester:	III
Hrs/Week:	1			**Credits:**	2

Course Objective
To develop the basic skills about various energy resources and its applications

Course outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember the fundamental concept of various energy resources	K1/ K2
CO2	Apply the physical principles of conventional and non-conventional sources to study the device and make measurements.	K3
CO3	Analyze the harvested energy from various available sources and utilize it based on the requirements	K4
CO4	Create solar related devices and make measurements	K5
CO5	Design and construct energy related devices and apply based on the available needs	K6

Mapping

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

H- High; M- Medium; L- Low

Programme Code:	B.Sc. PHY		Programme Title:		Bachelor of Physics	
Course Code:	22UPS405		Title	Batch:	2022 – 2025	
			Core V: Electricity & Magnetism	Semester:	IV	
Lecture Hrs./Week or Practical Hrs./Week	5	Tutorial Hrs./Sem.	-	Credits:	5	

Course Objective

To familiarize the students with the fundamental concepts and laws in electricity & magnetism and establish a foundation in electromagnetism

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Acquire the knowledge on fundamental concepts of electric and magnetic fields, potentials and electromagnetic induction	K1 / K2
CO2	Apply knowledge of electricity and magnetism to explain natural physical processes and related technological advances	K3
CO3	Analyze the problems in electromagnetism that establishes the conceptual understanding	K4
CO4	Evaluate the basic and advanced problems in the field of static and dynamic fields	K5
CO5	Design experiments and acquire data in order to explore physical principles, effectively communicate results, and critically evaluate related scientific studies	K6

Mapping

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

H – High; M – Medium; L – Low

Programme Code:	BSc PHY	Programme Title:	Bachelor of Science		
Course Code:	22UPS4N3	**Title**		Batch:	2022 - 2025
		Non-Major Elective II: Principles of Physics –II		Semester:	IV
Hrs/Week:	1			Credits:	2

Course Objective

To develop the scientific interests on the portable electronic devices for day to life

Course outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember the basic knowledge about portable devices	K1/K2
CO2	Apply the central concepts of electric and optical devices	K3
CO3	Analyze the basic physical phenomena on the operating features of scientific devices	K4
CO4	Evaluate the applications of the physical quantities	K5
CO5	Create equipment for measuring	K6

Mapping

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

H – High; M – Medium; L – Low

Programme Code:	BSc PHY	Programme Title:		Bachelor of Science	
Course Code:	22UPS4N4	**Title**		**Batch:**	2022 - 2025
		Non-Major Elective II : Renewable Energy Sources - II		**Semester:**	IV
Hrs/Week:	1			**Credits:**	2

Course Objective

To enrich the fundamental scientific skills in inexhaustible sources of energies

Course outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Remember and understand various energy sources like wind energy, bio mass energy and hydrogen energy	K1/ K2
CO2	Apply the basic physical concepts to develop devices based on the conversion technologies	K3
CO3	Analyze thedifferent forms of energy utilizing the basic concepts for various applications	K4
CO4	Design and develop the various energy related devices	K5
CO5	Evaluate and make measurements of the constructed devices	K6

Mapping

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

H- High; M- Medium; L- Low

Programme Code:	BSc PHY	Programme Title:		Bachelor of Science	
Course Code:	22UPS406	**Title**		**Batch:**	2022-2025
		Core VI: Physics Lab II		**Semester:**	III & IV
Hrs/Week:	3			**Credits:**	3

Course objective

- To understand the theory with hands-on experience.

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic principles of optics and electromagnetic field	K1/K2
CO2	Apply the knowledge of fundamentals of physics to execute experiments and to get appropriate results	K3
CO3	Analyse the theory of optics and electromagnetic field by verifying with obtained data	K4
CO4	Calibrate the devices using error correction methods	K5
CO5	Design instruments by using the principles behind every experiment and develop skills to work collectively	K6

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

Programme Code:		B.Sc. PHY		Programme Title:	Bachelor of Science	
Course Code:		22UPS507		Title	Batch:	2022 – 2025
				Core VII: Mechanics	Semester:	V
Lecture Hrs./Week	5	Tutorial Hrs./Sem.			Credits:	5

Course Objective

To acquire a complete knowledge about mechanics and classical dynamics

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the laws involved in Rigid body dynamics and classical mechanics	K1
CO2	Gain a deeper insight into the physical concepts and its application to various physical systems	K2
CO3	Apply these formalisms to obtain equations of motion for simple systems	K3
CO4	Analyze the problem and frame equations of motion	K4
CO5	Ability to Use the necessary skills and tools to write equations for real time problems	K5

Mapping

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc. PHY		Programme Title:	Bachelor of Science	
Course Code:	22UPS508		Title	Batch:	2022 – 2025
			Core VIII:	Semester:	V
Lecture Hrs./Week	5	Tutorial Hrs./Sem.	-	Optics & Spectroscopy	Credits:	5

Course Objective

To understand the mechanism of energy transfer and to impart knowledge in electromagnetic spectrum

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Demonstrate the characteristics of light and interaction of electromagnetic radiations with matter	K1
CO2	Apply the principle of molecular spectroscopy in identification of properties of materials and applications	K2
CO3	Categorize the spectra from vibrational and rotational motion of atoms or molecules	K3
CO4	Explain the theoretical models of spectroscopy that are suitable for each phenomena related to radiations	K4
CO5	Plan and design the instruments based on electromagnetic radiations by using the tools and methodologies of optics and spectroscopy	K5

Mapping

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

H – High; M – Medium; L – Low   78

ProgrammeCode:	B.Sc.PHY			Programme Title:	Bachelor of Physics
CourseCode:	22UPS509			**Title**	**Batch:**	2022 – 2025
				Core IX: Relativity & Quantum Mechanics	**Semester:**	V
LectureHrs./Week or PracticalHrs./Week	5	**TutorialHrs./Sem.**	-		**Credits:**	5

CourseObjective

To develop the skill to gain knowledge in Relativity & Quantum Mechanics

CourseOutcomes

Onthesuccessful completionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understand the limitations of classical mechanics and acquire the knowledge of Wave nature of matter	K1/K2
CO2	Illustrate Heisenberg uncertainty principle and obtain the wave equation for time dependent and time independent systems	K3
CO3	Analyze the wave equation and use it to solve physical problems	K4
CO4	Establish Schrodinger equation for hydrogen atom and outline the significance of Quantum numbers	K5
CO5	Understand the concepts and consequences of special theory of relativity	K6

Mapping

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

H–High;M– Medium;L–Low

Programme Code:	B.Sc. PHY		Programme Title:		Bachelor of Physics	
Course Code:	22UPS5E10		Title	Batch:	2022 – 2025	
			Core Elective - I : Basic Electronics & Circuit System	Semester:	V	
Lecture Hrs./Week or Practical Hrs./Week	5	Tutorial Hrs./Sem.	-	Credits:	5	

Course Objective

To provide fundamental skill to analyze electronic circuit systems and introduce basic semiconductor devices, their characteristics, operations and applications

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the fundamental concepts of electronic circuits with semiconductor devices	K1 / K2
CO2	Apply the knowledge of circuits to investigate PN junctions in semiconductor devices under various conditions	K3
CO3	Demonstrate familiarity with basic electronic components and use them to design simple electronic circuits	K4
CO4	Recognize a variety of exciting high-tech products and systems enabled by electronics	K5
CO5	Design, develop and simulate the new electronic circuits for applications in various fields	K6

Mapping

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc. PHY		Programme Title:		Bachelor of Physics	
Course Code:	22UPS5E11		**Title**	**Batch:**	2022 – 2025	
			Core Elective I: Communication Electronics	**Semester:**	V	
Lecture Hrs./Week or Practical Hrs./Week	5	**Tutorial Hrs./Sem.**	-	**Credits:**	5	

Course Objective

To provide fundamental knowledge of digital modulation techniques with the concepts of communication system and their applications

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the fundamental theories of electronic systems involved in communication	K1 / K2
CO2	Apply the knowledge of mathematical methods to resolve the components of digital communication system	K3
CO3	Analyze basic wireless transmission circuits using electronic devices and instruments	K4
CO4	Explain clearly the importance of transformation equations to convert signals from one domain to another in the field of digital communication	K5
CO5	Design and analyze the electronic circuit systems that are responsible for digital transmission using various simulation techniques	K6

Mapping

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc. PHY		Programme Title:		Bachelor of Physics	
Course Code:	22UPS5E12		Title	Batch:	2022 – 2025	
				Semester:	V	
Lecture Hrs./Week or Practical Hrs./Week	5	Tutorial Hrs./Sem.		Materials Science	Credits:	5

Course Objective

To acquire basic knowledge of atomic structure and binding conditions of atom in the materials.

To acquire enveloping knowledge of physics, chemistry, metallurgy and mathematics to know wider field of materials science

To provoke the students to pursue research in the field of materials science.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the physics behind the material formation and different properties of the solids.	K1, K2
CO2	Tailor the properties of solids materials with the adequate knowledge.	K3
CO3	Develop a new materials based on the fundamental understanding of the properties	K3
CO4	Evaluate the materials properties for the cutting-edge applications	K4
CO5	Design and analysis the experimental/materials strategies	K5

Mapping

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

H-High; M-Medium; L-Low;

Programme Code:	B.Sc. PHY	Programme Title:	Bachelor of Science	
Course Code:	22UPS5AL1	Title	Batch:	2022 – 2025
		Advanced Learner Course - I - Problem Solving Skills in Physics I	Semester:	V
Lecture Hrs./Week	Tutorial Hrs./Sem.		Credits:	5

Course Objective

Student will be introduced to solve problems in core physics. Every unit must contain minimum 20 problems based on various principles of Physics.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Get motivated to acquire problem solving skills in Physics	K1/K2
CO2	Apply the skills to solve in Mechanics, Thermal Physics and Electricity	K3
CO3	Select and use appropriate concepts and methods to solve problems effectively and creatively	K4
CO4	Identify, evaluate and synthesize information and engage the imagination to explore new possibilities	K5
CO5	Crack problems confidently in competitive examinations like JEST, JAM& TIFR	K6

Mapping

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

H – High; M – Medium; L – Low   83

ProgrammeCode:	B.Sc.PHY			Programme Title:		BachelorofPhysics	
CourseCode:	22UPS5S1			Title	Batch:	2022 – 2025	
				Skill based	Semester:	V	
LectureHrs./Week or PracticalHrs./Week	1	TutorialHrs./Sem.	-	Elective I: Mechanical Measurements	Credits:	3	

CourseObjective

To enrich the basic foundation and inspire interest for the knowledge in Mechanical measurements

CourseOutcomes

Onthesuccessful completionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understand the operational features, limitations and difficulties inherent in the instruments	K2
CO2	Classify and select proper measuring instrument for pressure and flow measurement	K3
CO3	Implement the operation and construction to infer the instrument characteristics	K4
CO4	Evaluate the accuracy, error and calibration of an instrument	K5
CO5	Design and use simple instrumentation for a measurement of mechanical properties.	K6

Mapping

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

H–High;M– Medium;L–Low

ProgrammeCode:	B.Sc.PHY			Programme Title:	BachelorofPhysics	
CourseCode:	22UPS5S2			Title	Batch:	2022 – 2025
				Skill based Elective I: Fundamentals of Biophysics	Semester:	V
LectureHrs./Week or PracticalHrs./Week	1	TutorialHrs./Sem.	-		Credits:	3

CourseObjective
To develop the basic knowledge about Biophysics and its Applications

CourseOutcomes

Onthesuccessful completionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Acquire the knowledge on the key principles of physics toward evaluating and analyzing the biological phenomenon.	K2
CO2	Apply the separation and physico-chemical techniques to study biological Structure	K3
CO3	Implement the characteristics of a biological system using the concept of physics and chemistry	K4
CO4	Explain the techniques and underlying concept of physics of Bio mechanics and Neuro- Biophysics	K4
CO5	Evaluate the physical and chemical properties of biological applications	K5

Mapping

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

Medium;L–Low

Course Code:	22UPS614			Title	Batch:	2022 - 2025
				Core X: Atomic & Nuclear Physics	Semester:	VI
Lecture Hrs./Week or Practical Hrs./Week	5	Tutorial Hrs./Sem.			Credits:	5

Course Objective

To comprehend the structure and properties of electron and the nucleus

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Acquire fundamental knowledge about the electronic and nuclear structure of atoms	K1
CO2	Understand the influence of X-rays, atomic and nuclear physics on modern scientific developments	K2
CO3	Apply the key strategies to investigate the atomic and nuclear physics that affects our everyday living	K3
CO4	Analyze techniques to examine and understand the processes within material industry and medical applications of nuclear phenomena	K4
CO5	Evaluate properties of elementary particles, associated symmetries, conservations and models	K5

Mapping

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

H-High; M-Medium; L-Low

Programme Code:	B.Sc. PHY		Programme Title:	Bachelor of Physics	
Course Code:	22UPS615		Title	Batch:	2022 - 2025
			Core XI: Solid State Physics& Statistical Mechanics	Semester:	VI
Lecture Hrs./Week or Practical Hrs./Week	5	Tutorial Hrs./Sem.		Credits:	5

Course Objective

To study the basic theory of crystal structure, composition and physical properties of crystalline materials.Study the electrical and magnetic properties of solids through 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 basic structural parameters, characteristics and behavior of matter in whichever phase they are in	K1/K2
CO2	Apply theoretical insights on the external application of force and torque and also understanding the underlying theory in it	K3
CO3	Analyze the conceptual understanding of the facts through implications of Quantum statistical concept.	K4
CO4	Evaluate the application aspects of above-mentioned behavior in innovative research work	K5
CO5	Create experimental insights into material design and property evaluation using classical and quantum principles	K6

Mapping

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

H-High; M-Medium; L-Low

ProgrammeCode:	B.Sc.PHY		Programme Title:	BachelorofPhysics	
CourseCode:		87	Title	Batch:	2022 – 2025

	22UPS6E16	Core Elective II: Digital Circuit systems & Microprocessor	Semester:	VI
LectureHrs./Week or PracticalHrs./Week	5	**TutorialHrs./Sem.**	-	Credits:	5

CourseObjective

To study the number system, Logic circuits and its application and to understand the architecture and instruction set of 8085 microprocessors

CourseOutcomes

Onthesuccessful completionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understanding the operations of BCD numbers and memory allocation in computers	K2
CO2	Develop effective problem solving abilities	K3
CO3	Analyze electronic circuits	K4
CO4	Apply the concept of basic electronic devices to design various circuits	K5
CO5	Understand and to implement digital electronics and Microprocessor.	K6

Mapping

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

H–High;M– Medium;L–Low

Programme Code:	B.Sc. PHY		Programme Title:	Bachelor of Science	
Course Code:	22UPS6E17	88	Title	Batch:	2022 – 2025

				Core Elective II : Biomedical Instrumentation	**Semester:**	VI
Lecture Hrs./Week	5	**Tutorial Hrs./Sem.**	-		**Credits:**	5

Course Objective

To familiarize with the use of medical instruments and gain the knowledge in operation of modern biomedical instruments

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Recall the structure of cell, physiology of different biological systems and their functions.	K1
CO2	Illustrate the types of electrodes and measurements of biological parameters.	K2
CO3	Explain the working of diagnostic instruments, therapeutic instruments and imaging systems.	K3
CO4	Analyse the different methods of measurements of biological parameters.	K4
CO5	Compare the different techniques of measurement in medical field.	K5

Mapping

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc. PHY		**Programme Title:**	Bachelor of Physics	
Course Code:	22UPS6E18	89	**Title**	**Batch:**	2022 – 2025
			Core Elective II :Nanomaterials	**Semester:**	VI
Lecture Hrs./Week	5				

or Practical Hrs./Week		Tutorial Hrs./Sem.		and applications	**Credits:**	5

Course Objective

To lay foundation of Nano science and Nanotechnology.

To provide the fundamental knowledge of nano materials, their synthesis and fabrication, properties and applications.

To provoke the students to pursue research in the field of nanomaterials

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the fundamental of nanomaterials and nanotechnology	K1,K2
CO2	Synthesize nanomaterials using various physical and chemical methods	K3
CO3	Tune the size and shape of the nanomaterials for diverse applications	K4
CO4	Evaluate the properties of nanomaterials and defects nature of the materials	K4
CO5	Design nano materials-based devices and analysis their performance	K4,K5

Mapping

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

H-High; M-Medium; L-Low

ProgrammeCode:	B.Sc.PHY	**Programme Title:**		Bachelor ofPhysics	
CourseCode:	22UPS6E19	**Title**	**Batch:**	2022 – 2025	
		Core Elective III:	**Semester:**	VI	

90

LectureHrs./Week or PracticalHrs./Week	5	TutorialHrs./Sem.		C Programming & Information Security	Credits:	5

CourseObjective

To develop the skill to gain knowledge in Programming in C & Information Security

CourseOutcomes

Onthesuccessful completionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understand the basic concepts of C programming and information security	K1/K2
CO2	Apply the concepts of C programming to solve problems in Physics	K3
CO3	Analyze the importance of operators, control statements, functions, structures and pointers in problem solving	K4
CO4	Evaluate the impact of various types of attacks on information leakage and security	K5
CO5	Create the advance perspectives on prevention through cyber-crime of wireless digital communications including internet and e-commerce	K6

Mapping

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

Medium;L–Low

Programme Code:	B.Sc. PHY	Programme Title:	Bachelor of Science	
Course Code:	22UPS6E20	Title	Batch:	2022 – 2025

				Core Elective III : Industrial Instrumentation	**Semester:**	VI
Lecture Hrs./Week	5	**Tutorial Hrs./Sem.**	-		**Credits:**	5

Course Objective

To make the student familiar with measurement techniques of physical quantities and analyze the data

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the principles of instruments used in different industrial sectors	K1
CO2	Elucidate the construction and working of various industrial devices in measuring physical quantities	K2
CO3	Analyze the performance and characteristics of each instrument	K3
CO4	Make the new models for calibration and configuration of instruments	K4
CO5	Formulate the instruments for specific applications in industries	K5

Mapping

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc. PHY	**Programme Title:**		Bachelor of Physics	
Course Code:	22UPS6E21	**Title**		**Batch:**	2022 – 2025
		Core Elective III: Python	**Semester:**		VI
Lecture Hrs./Week	5		-	**Credits:**	5

or Practical Hrs./Week		Tutorial Hrs./Sem.		Programming		

Course Objective

To provide fundamental knowledge of Python programming and create the ability to interpret physics oriented problems using Python

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basics, structure and functions of Python programming as useful scripting language	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	Categorize various statements of Python programming into the lists and tuples	K4
CO4	Explain clearly the importance of different function statements and pass the arguments between functions	K5
CO5	Implement and compile the python programming for application in the field of Physics	K6

Mapping

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

H – High; M – Medium; L – Low

Programme Code:	B.Sc. PHY	Programme Title:	Bachelor of Science		
Course Code:	22UPS6AL2 93	**Title**		**Batch:**	2022 – 2025
		Advanced		**Semester:**	VI

Lecture Hrs./Week		Tutorial Hrs./Sem.		Learner Course - II - Problem Solving Skills in Physics II	Credits:	5

Course Objective

Student will be introduced to solve problems in core physics. Every unit must contain minimum 20 problems based on various principles of Physics.

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Get motivated to acquire problem solving skills in Physics	K1/K2
CO2	Apply the skills to solve in Magnetism, Quantum Mechanics, General Physics etc	K3
CO3	Select and use appropriate concepts and methods to solve problems effectively and creatively	K4
CO4	Interpret and use written, quantitative, and visual text effectively in presentation of solutions to problems	K5
CO5	Crack problems confidently in competitive examinations like JEST, JAM & TIFR	K6

Mapping

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

H – High; M – Medium; L – Low

ProgrammeCode:	B.Sc.PHY	94	Programme Title:	BachelorofPhysics

CourseCode:	22UPS6S3			Title	Batch:	2022 – 2025
				Skill based Elective II: Environmental Instrumentation	Semester:	VI
LectureHrs./Week or PracticalHrs./Week	1	TutorialHrs./Sem.	-		Credits:	2

CourseObjective

To get adequate knowledge in thermal measurements and to understand the operational features, limitations and difficulties faced in the instrumentation

CourseOutcomes

Onthesuccessful completionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Use the concept of measurement	K1
CO2	Understand the design and operation of instruments for measurements of various environmental factors.	K2
CO3	Use adequate equipment to determine the state of pollution in the environment	K3
CO4	Apply the technical and analytical skill for interpretation of environmental data	K4
CO5	Understand the living conditions in industrial areas	K5

Mapping

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

Medium;L–Low

ProgrammeCode:	B.Sc.PHY	95	Programme Title:	BachelorofPhysics

CourseCode:	22UPS6S4			Title	Batch:	2022 – 2025
				Skill based Elective II: Fundamentals of Astrophysics	Semester:	VI
LectureHrs./Week or PracticalHrs./Week	1	TutorialHrs./Sem.	-		Credits:	2

CourseObjective

To explore the basic knowledge and recent aspects of Space science, Quasars and Cosmology

CourseOutcomes

Onthesuccessful completionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Recollect the origin and destiny of universe, astronomy, stars, quasars, cosmology	K1
CO2	Acquire the fundamental ideas of observational astronomy, stars, white dwarfs, nature of black holes and big bang theory	K2
CO3	Implement the phenomena and processes associated with galaxy, stellar and formation of planetary systems, dark matter and energy	K3
CO4	Figure out the concept of red shift, expansion of universe, accelerating universe is essential for scientific and research applications	K4
CO5	Elucidate the origin of universe and various models based on cosmological principles	K5

Mapping

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

H–High;M– Medium;L–Low

ProgrammeCode:	B.Sc.PHY		Programme Title:	Bachelorof Physics	
CourseCode:	22UPS622	96	Title	Batch:	2022 – 2025
			Core XII:	Semester:	V & VI

LectureHrs./Week or PracticalHrs./Week	3	TutorialHrs./Sem.	-	Electronics Lab	Credits:	3

CourseObjective

To provide a basic knowledge in the field of Electronics and to familiarize their operations

CourseOutcomes

Onthesuccessful completionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understand the basic principles of Electronics	K1/K2
CO2	Apply the principle in circuit designing	K3
CO3	Analyze the characteristics of transistor, FET and Op-amp	K4
CO4	Evaluate the working of Electronic devices	K5
CO5	Design circuits and verify its operation	K6

Mapping

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

H–High;M– Medium;L–Low

ProgrammeCode:	B.Sc.PHY			Programme Title:	BachelorofPhysics	
CourseCode:	22UPS623			Title	Batch:	2022 – 2025
				Core XIII: Digital & Microprocessor Lab	Semester:	V &VI
LectureHrs./Week or PracticalHrs./Week	3	TutorialHrs./Sem.	-		Credits:	3

CourseObjective

To be acquainted with the basics and working of Electronic Digital circuits and Microprocessor.

CourseOutcomes

Onthesuccessful completionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understand the working conditions of logic circuits and its applications	K2
CO2	Construct and demonstrate of flip flop and digital circuits	K3
CO3	Determine the behavior of a digital logic circuit	K4
CO4	Translate the Boolean equations/expressions to efficient combinational and sequential circuits.	K5
CO5	Execute simple programmesusing 8085 microprocessor	K5

Mapping

PO /PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
CO1	H	H	M	H	M	H	H	M
CO2	H	H	M	H	M	H	H	-
CO3	H	M	M	H	L	H	H	M
CO4	M	H	M	H	L	H	M	M
HCO5	H	H	H	H	M	H	H	H

H–High;M– Medium;L–Low

Programme Code:	B.Sc. PHY	Programme Title:	Bachelor of Science	
Course Code:	22UPS624	**Title**	**Batch:**	2022 – 2025
		Core XIV : Computer lab in C	**Semester:**	VI
Lecture Hrs./Week	2	**Tutorial Hrs./Sem.**	-	**Credits:**	2

Course Objective

To develop the skill to gain knowledge in C language

Course Outcomes

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

CO Number	CO Statement	Knowledge Level
CO1	Understand and become familiar with C programs	K1
CO2	Apply the statements to write the programs	K2
CO3	Demonstrate the use of functions and arguments in C language	K3
CO4	Explain the concepts of conditional and looping statements	K4
CO5	Write new programs for application in various field of Physics	K5

Mapping

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

H – High; M – Medium; L – Low

Programme Code:	BSc PHY	Programme Title:	Bachelor of Science		
Course Code:	21UMS3A3/ 21UCY3A3	**Title** Physics for Mathematics and Chemistry - I	**Batch:**	2022 - 2025	
			Semester:	III	
Hrs/Week:	5		**Credits:**	4	

Course Objective

To acquire the knowledge in concepts of applied physics

Course outcomes

CO Number	CO Statement	Knowledge Level
CO1	To remember the basic principles in mechanics	K1/K2
CO2	To apply knowledge in estimating the mechanical parameters	K3
CO3	To analyze the knowledge in applications	K4
CO4	To evaluate the principles of physics in mathematics and chemistry	K5
CO5	To create a different types of lasers and fibers related this studies	K6

Mapping

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

H – High; M – Medium; L – Low

Programme code:	BSc PHY	ProgrammeTitle :	Bachelor of Science		
Course Code:	21 UMS 4A4 / 21 UCY 4A4	Title		Batch :	2022 - 2025
		Physics For Mathematics & Chemistry- II		Semester	IV
Hrs/Week:	5			Credits:	4

Course Objective

To develop the basic concepts of physics applied in chemistry and mathematics

Course outcomes

CO Number	CO Statement	Knowledge Level
CO1	To remember the basic concepts of physics in electricity, semiconductors, optics and digital electronics	K1/K2
CO2	To apply analog and digital systems	K3
CO3	To analyze knowledge on number systems and logical expressions	K4
CO4	To evaluate the expressions into useful circuits	K5
CO5	To create logic gates circuits	K6

Mapping

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

H-High; M-Medium; L-Low

Programme Code:	BSc PHY	Programme Title:		Bachelor of Science	
		Title	Batch:	2022 - 2025	
Course Code:	21UMS4A5 / 21UCY4A5	Physics Lab For Mathematics & Chemistry	Semester:	III & IV	
Hrs/Week:	3		Credits:	4	

Course Objective

To enable the student to gain practical knowledge in Physics instruments

Course Outcomes

CO Number	CO Statement	Knowledge Level
CO1	To remember depth knowledge in Elasticity of rigid materials	K1/K2
CO2	To analyze the concepts of physics on measurements and instrumentations of physical experiments	K3
CO3	To apply practical skills in analog and digital measurements	K4
CO4	To evaluate concepts of logic gates	K5
CO5	To create various logic gates using Ics	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	H	H	M	-	M	-	H	-
CO4	M	L	H	H	H	H	M	H

H-High; M-Medium; L-Low

HoD

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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:	19PPS101	**Title**		**Batch:**	2019 - 2021
		Core I: Classical and Non linear Dynamics		**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	S	H	S	H
CO2	S	M	S	H	M
CO3	M	H	H	M	S
CO4	S	S	S	M	H

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

Programme Code:	MSC	Programme Title:		Master of Science	
Course Code:	19PPS102	**Title**		**Batch:**	2019 - 2021
		Core II : Quantum Mechanics-I	**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	S	M	H	M	S
CO2	M	H	M	S	L
CO3	S	H	M	S	M
CO4	M	M	H	M	M

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

Programme Code:	MSC	Programme Title:		Master of Science	
Course Code:	19PPS103	**Title**		**Batch:**	2019 - 2021
		Core III: Mathematical Physics		**Semester:**	I
Hrs/Week:	5			**Credits:**	4

Course Objective

- To apply knowledge of mathematical methods in the concepts of Physics

Course outcomes

K1	CO1	To recollect the basic mathematical relations such as tensors, special functions, wave equations etc
K2	CO2	To apply the correct mathematical formulae to solve the expressions in physics
K3	CO3	To implement the functions and equations in the field of physics
K4	CO4	To evaluate the problems in classical quantum and Electromagnetic field theory

Mapping

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

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

Programme Code:	MSC	**Programme Title:**	Master of Science	
Course Code:	19PPS1E1	**Title** Major Elective I: Applied Electronics	**Batch:**	2019-2021
			Semester:	I
Hrs/Week:	5		**Credits:**	5

Course Objective

- To understand the action of semiconductor devices, amplifiers and oscillators

Course outcomes

K1	CO1	To acquire the basic knowledge in semiconductor devices
K2	CO2	Understand the different types of amplifiers
K3	CO3	Able to design Op-amp Circuits for various practical applications
K4	CO4	Design oscillators and multi-vibrators with the acquired knowledge on electronics

Mapping

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

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

Programme Code:	MSC	Programme Title:		Master of Science	
Course Code:	19PPS204	**Title** Core IV: Statistical Mechanics		**Batch:**	2019 - 2021
				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	S	H	S	H
CO2	S	M	S	H	M
CO3	M	H	H	M	S
CO4	S	S	S	M	H

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

Programme Code:	MSC	Programme Title:		Master of Science	
Course Code:	19PPS205	**Title** Core V: Quantum Mechanics-II		**Batch:**	2019-2021
				Semester:	II
Hrs/Week:	5			**Credits:**	4

Course Objective

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

Course outcomes

K1	CO1	Acquire thorough knowledge and understanding on the basic principles of quantum mechanics and their applications to various physical and chemical problems
K2	CO2	Understand the effects of special relativity in quantum mechanics and to gain an insight in the quantum field theory
K3	CO3	Apply the concepts of quantum mechanics to quantitatively predict the behavior of physical systems
K4	CO4	Analyse and apply the modern quantum mechanical methods for determining electronic structure of molecules and atoms

Mapping

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

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

Programme Code:	MSC	Programme Title:	Master of Science	
Course Code:	19PPS206	**Title**	**Batch:**	2019 - 2021
		Core VI: Electromagnetic Theory & Plasma Physics	**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 incompletion 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	S
CO2	S	S	S	M	H
CO3	M	H	H	M	S
CO4	M	M	S	M	H

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

Programme Code:	MSC	Programme Title:		Master of Science	
Course Code:	19PPS207	**Title**		**Batch:**	2019 - 2021
		Core VII: Electronic Communications and Cyber security		**Semester:**	II
Hrs/Week:	5			**Credits:**	4

Course Objective

- To develop the scientific skills in the Electronic Communication systems and Cyber security

Course outcomes

K1	CO1	To understand the various modulation techniques and the generation of microwaves
K2	CO2	To apply the basic physical concepts on satellite communication
K3	CO3	To implement the modulation techniques in the RADAR communication systems
K4	CO4	To know about the concepts of internet cyber security

Mapping

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

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

Programme Code:	MSC	Programme Title:		Master of Science	
Course Code:	19PPS2N1	Title		Batch:	2019-2021
		Non Major Elective : Non Conventional Energy Sources		Semester:	II
Hrs/Week:	1			Credits:	2

Course Objective

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

K1	CO1	To recollect the applications of physics in real world
K2	CO2	To understand the principles of physics involving various natural and artificial process
K3	CO3	To implement the basics laws of physics in the field of non conventional energy sources
K4	CO4	To analyze the efficiency of devices and instruments used in the production of energy

Mapping

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

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

Programme Code:	MSC	Programme Title:		Master of Science	
Course Code:	19PPS2N2	Title		Batch:	2019 - 2022
		Non Major Elective: Communication Systems		Semester:	II
Hrs/Week:	1			Credits:	2

Course Objective

- To apply knowledge of physics in the field of communication systems

Course outcomes

K1	CO1	To recollect the basics of analog and digital circuit system
K2	CO2	To understand the conversion of analog to digital signals and modern methods for the transmission of signals
K3	CO3	To implement the digital transmission by using recent electronic devices
K4	CO4	To analyze the difference in communicating the signals through various methods

Mapping

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

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

Programme Code:	MSC	Programme Title:		Master of Science	
Course Code:	19PPS204	**Title** Core IV: Statistical Mechanics		**Batch:**	2019 - 2021
				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	S	H	S	H
CO2	S	M	S	H	M
CO3	M	H	H	M	S
CO4	S	S	S	M	H

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

Programme Code:	MSC	Programme Title:		Master of Science	
Course Code:	19PPS205	**Title**		**Batch:**	2019-2021
		Core V: Quantum Mechanics-II		**Semester:**	II
Hrs/Week:	5			**Credits:**	4

Course Objective

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

Course outcomes

K1	CO1	Acquire thorough knowledge and understanding on the basic principles of quantum mechanics and their applications to various physical and chemical problems
K2	CO2	Understand the effects of special relativity in quantum mechanics and to gain an insight in the quantum field theory
K3	CO3	Apply the concepts of quantum mechanics to quantitatively predict the behavior of physical systems
K4	CO4	Analyse and apply the modern quantum mechanical methods for determining electronic structure of molecules and atoms

Mapping

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

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

Programme Code:	MSC	Programme Title:		Master of Science	
Course Code:	19PPS206	**Title**		**Batch:**	2019 - 2021
		Core VI: Electromagnetic Theory & Plasma Physics		**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 incompletion 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	S
CO2	S	S	S	M	H
CO3	M	H	H	M	S
CO4	M	M	S	M	H

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

Programme Code:	MSC	Programme Title:		Master of Science	
		Title		**Batch:**	2019 - 2021
Course Code:	19PPS207	Core VII: Electronic Communications and Cyber security		**Semester:**	II
Hrs/Week:	5			**Credits:**	4

Course Objective

- To develop the scientific skills in the Electronic Communication systems and Cyber security

Course outcomes

K1	CO1	To understand the various modulation techniques and the generation of microwaves
K2	CO2	To apply the basic physical concepts on satellite communication
K3	CO3	To implement the modulation techniques in the RADAR communication systems
K4	CO4	To know about the concepts of internet cyber security

Mapping

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

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

Programme Code:	MSC	Programme Title:	Master of Science	
Course Code:	19PPS208	**Title** Core XIII: General Physics Lab I	**Batch:**	2019 - 2021
			Semester:	I & II
Hrs/Week:	4		**Credits:**	4

Course Objective
- To understand the techniques of advanced physics experiments

Course outcomes

K3	CO1	To familiarize with the experimental techniques
K4	CO2	To get the idea about the experimental setup and arrangement of device
K5	CO3	To verify the experimental results with theoretical values

Mapping

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

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

Programme Code:	MSC	Programme Title:	Master of Science	
Course Code:	19PPS209	Title	Batch:	2019- 2021
		Core IX: Electronics Lab I	Semester:	I & II
Hrs/Week:	4		Credits:	4

Course Objective

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

Course outcomes

K3	CO1	Remember the applications of semiconductor devices
K4	CO2	To get the idea and principles of electronics practically
K5	CO3	To access the action of electronic devices such as diode, transistor, UJT and FET etc.

Mapping

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

S – Strong; 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 Mossbaurer Spectroscopy
K4	CO4	To review the theory and applications of NMR, ESR, NQR and Mossbaurer Spectroscopy

Programme Code:	MSC	Programme Title:		Master of Science

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:	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

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	
		Title	Batch :	2019 - 2021
Course Code:	19PPS412	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

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:	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 buid 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:	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:	19PPS415	**Title**	**Batch:**	2019-2021	
		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	S	S	S	S
CO2	H	S	S	L	M
CO3	M	M	M	M	S

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

Programme Code:	MSC	Programme Title:		Master of Science	
Course Code:	19PPS416	Title		Batch:	2019-2021
		Core XVI: Computer Lab in C++		Semester:	IV
Hrs/Week:	2			Credits:	3

Course Objective

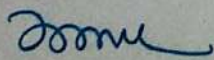- To acquire basic knowledge in object oriented programming

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	S	S	H
CO2	S	H	S	S	S
CO3	H	S	H	S	H

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

Programme Code:	MSC	Programme Title:		Master of Science	
Course Code:	19PPS417	Title		Batch:	2019-2021
		Core XVII: Project		Semester:	IV
Hrs/Week:	3			Credits:	8

HoD

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20PPS101 Core I: Classical Mechanics

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

20PPS1E1   Major Elective I- Applied Electronics

Course Objective

To understand the action of semiconductor devices, amplifiers and oscillators

Course outcomes

K1	CO1	To acquire the basic knowledge in semiconductor devices
K2	CO2	Understand the different types of amplifiers
K3	CO3	Able to design Op-amp Circuits for various practical applications
K4	CO4	Design oscillators and multi-vibrators with the acquired knowledge on electronics

Mapping

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

H – High; M – Medium; L – Low

20PPS102 Quantum Mechanics

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

Course Objective

- To apply knowledge of mathematical methods in the concepts of Physics

Course outcomes

K1	CO1	To recollect the basic mathematical relations such as tensors, special functions, wave equations etc
K2	CO2	To apply the correct mathematical formulae to solve the expressions in physics
K3	CO3	To implement the functions and equations in the field of physics
K4	CO4	To evaluate the problems in classical quantum and Electromagnetic field theory

Mapping

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

H – High; M – Medium; L – Low

20PPS204 Statistical Mechanics

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

20PPS205 Advanced Quantum Mechanics

Course Objective

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

Course outcomes

K1	CO1	Acquire thorough knowledge and understanding on the basic principles of quantum mechanics and their applications to various physical and chemical problems
K2	CO2	Understand the effects of special relativity in quantum mechanics and to gain an insight in the quantum field theory
K3	CO3	Apply the concepts of quantum mechanics to quantitatively predict the behavior of physical systems
K4	CO4	Analyse and apply the modern quantum mechanical methods for determining electronic structure of molecules and atoms

Mapping

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

H – High; M – Medium; L – Low

20PPS206 Electromagnetic theory & Electrodynamics

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 incompletion 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

20PPS207 Electronic Communications and Cyber security

Course Objective

- To develop the scientific skills in the Electronic Communication systems and Cyber security

Course outcomes

K1	CO1	To understand the various modulation techniques and the generation of microwaves
K2	CO2	To apply the basic physical concepts in analog, pulse and digital communication
K3	CO3	To implement the modulation techniques in the RADAR communication systems
K4	CO4	To know about the concepts of internet cyber security

Mapping

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

H – High; M – Medium; L – Low

20PPS208 General Physics Lab I

Course Objective

To understand the techniques of advanced physics experiments
Course outcomes

K3	CO1	To familiarize with the experimental techniques
K4	CO2	To get the idea about the experimental setup and arrangement of device
K5	CO3	To verify the experimental results with theoretical values

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

20PPS209 Electronics Lab I

Course Objective

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

Course outcomes

K3	CO1	Remember the applications of semiconductor devices
K4	CO2	To get the idea and principles of electronics practically
K5	CO3	To access the action of electronic devices such as diode, transistor, UJT and FET etc.

Mapping

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

H – High; M – Medium; L – Low

20PPS310 Molecular Spectroscopy

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	H	H	H	H	H
CO2	H	H	H	H	H
CO3	H	M	H	H	M
CO4	M	H	M	H	H

H – High; M – Medium; L – Low

20PPS311 Condensed Matter Physics

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	H	H	M	H	M
CO2	H	M	H	H	M
CO3	M	H	H	M	M
CO4	H	M	L	M	H

H – High; M – Medium; L – Low

20PPS3E2 Thin film & Nano science

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	M	H	H	H	H
CO2	H	M	H	H	M
CO3	H	H	H	H	H
CO4	H	H	H	M	H

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

20PPS4E3 Microprocessor & Object-OrientedProgramming with C++

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 buida secure program
K4	CO4	To solve problems in Physics based on microprocessor and OOPS

Mapping

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

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

20PPS412 Lasers & Non-Linear Optics

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	H	H	M	H	H
CO2	H	H	M	H	H
CO3	M	H	H	H	M
CO4	H	M	H	M	H

H – High; M – Medium; L – Low

20PPS413 Nuclear & Particle Physics

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	H	H	H
CO2	H	H	M	H	M
CO3	H	M	H	M	L
CO4	H	M	H	M	H

H – High; M – Medium; L – Low

20PPS414 General Physics Lab II

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

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

H – High; M – Medium; L – Low

20PPS415 Electronics Lab II

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

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20PPS416 Computer Lab in C++

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

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20UPS101 Properties of Matter

Course Objective

To understand the basic concepts of gravitation and to get exposure to the properties of liquids and solids

Course outcomes

K1	CO1	To understand the dynamics and gravitation
K2	CO2	To understand the applications of the elastic properties of solids
K3	CO3	To explain the molecular theory of surface tension, viscosity and diffusion
K4	CO4	Familiarize with general terms in acoustics like intensity, loudness, reverberation etc, and study in detail about production, detection, properties and uses of ultrasonic waves

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

H – High; M – Medium; L – Low

20UPS202 Heat & Thermodynamics

Course Objective

To understand of the fundamental laws and principles of thermodynamics and heat transfer

Course outcomes

K1	CO1	To recognize the difference between heat and temperature
K2	CO2	To understand the fundamental laws and principles of heat transfer and theory of gases
K3	CO3	To acquire working knowledge on low temperature physics and its domestic applications
K4	CO4	To analyse and evaluate various thermodynamic cycles used for energy productions

Mapping

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

CO4	H	M	H	M	H

H – High; M – Medium; L – Low

20UPS203 Physics Lab I

Course Objective

- To develop the skill to gain knowledge in Physics Lab I

Course Outcomes

K3	CO1	To recollect the basic principles taught
K4	CO2	To understand and apply the knowledge of theory to experiments
K5	CO3	To validate the experiment with theory

Mapping

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

H – High; M – Medium; L – Low

20UPS304 Mathematical Physics

Course objective

To apply the concepts of Mathematics in Physics and to acquire the basic knowledge about mathematical methods

Course outcomes

K1	CO1	To enrich the knowledge about mathematical concepts in Physics
K4	CO2	Able to relate mathematics and physics to understand nature

K3	CO3	Able to apply skills of mathematical modeling in applied fields
K3	CO4	To implement numerical methods in research fields

Mapping

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

H - High; M- Medium; L- Low

20UPS405 Electricity & Magnetism

Course Objective

To demonstrate the knowledge of electricity and magnetism in formulating and solving practical problems.

Course outcomes

K1	CO1	To acquire the knowledge on fundamental concepts of electric and magnetic field
K2	CO2	To understand the concept of electric field, potential and electromagnetic induction
K3	CO3	To implement the ideas for making the electrical devices such as capacitor, inductor, resistance, etc.,
K4	CO4	To evaluate the basic and advanced problems in the field of electromagnetic theory

Mapping

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

CO2	H	M	H	H	M
CO3	M	H	H	M	L
CO4	H	M	L	M	H

H – High; M – Medium; L – Low

20UPS406 Physics Lab II

Course objective

To understand the theory with hands-on experience.
Course outcomes

K3	CO1	Able to understand optics and electromagnetic field
K4	CO2	Able to determine earth's constant M & H
K5	CO3	Understanding the principles behind every experiments

Mapping

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

H – High; M – Medium; L – Low

20UPS507 Mechanics

Course Objective

To acquire a complete knowledge about mechanics and classical dynamics
Course outcomes

K1	CO1	To remember the principles of rigid body, statics and classical dynamics
K2	CO2	To understand the mechanics behind rigid body, projectiles and dynamics
K3	CO3	To apply these formalisms to obtain equations of motion for simple systems
K4	CO4	To represent these formalisms for mechanical systems

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

H – High; M – Medium; L – Low

20UPS508 Optics & Spectroscopy

Course Objective

To understand the mechanism of energy transfer and to impart knowledge in electromagnetic spectrum

Course outcomes

K1	CO1	To gain knowledge about fundamental properties of light, electromagnetic spectrum and splitting of spectral lines.
K2	CO2	To apply the energy transfer for absorption and emission spectra
K3	CO3	To determine structure of the molecules
K4	CO4	To evaluate bond angle and bond length etc.

Mapping

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

H – High; M – Medium; L – Low

20UPS509 Basic Electronics & Circuit System

Course Objective

To understand the basic concepts of electronics and to implement the electronic circuits to various industrial applications.

Course outcomes

K1	CO1	To recollect the fundamental concepts and developments of electronics
K2	CO2	To understand the construction and operations of semiconductor devices
K3	CO3	To apply the knowledge of basic theorems in analog circuits
K4	CO4	To design electronic and optoelectronic circuits and interpret the output

Mapping

PSO/CO	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	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

20UPS510 Digital Circuit systems & Microprocessor

Course objective

- To study the number system, Logic circuits and its application and to understand the architecture and instruction set of 8085 microprocessor

Course outcomes

K2	CO1	Understanding the operations of BCD numbers and memory allocation in computers
K5	CO2	Develop effective problem solving abilities
K4	CO3	Analyze electronic circuits
K3	CO4	Apply the concept of basic electronic devices to design various circuits

Mapping

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

H – High; M – Medium; L – Low

20UPS612 Relativity & Quantum Mechanics

Course Objective

- To develop the skill to gain knowledge in Relativity & Quantum Mechanics

Course Outcomes

K1	CO1	To keep in mind the concepts and the consequences of special and general theory of relativity
K2	CO2	To understand the basic concepts of Quantum theory and the wave properties of particles
K3	CO3	To apply the wave equation to solve simple problems
K4	CO4	To interpret the different types of quantum numbers

Mapping

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

CO3	H	H	H	H	M
CO4	M	H	M	H	H

H – High; M – Medium; L – Low

20UPS613 Atomic & Nuclear Physics

Course Objective

- To understand the structure and properties of electron and the nucleus

Course outcomes

K1	CO1	Develop understanding about the electronic and nuclear structure of atoms
K2	CO2	Appreciate the influence of X-rays, atomic and nuclear physics on modern scientific developments
K3	CO3	Analyze the key areas in which atomic and nuclear physics affects our everyday living
K4	CO4	Apply various tools and techniques to examine and understand the processes within material industry and medical applications of nuclear phenomena

Mapping

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

H – High; M – Medium; L – Low

20UPS614 Condensed Matter Physics & Statistical Mechanics

Course objective

- To understand the electrical and magnetic properties of solids through classical and quantum statistics

Course outcomes

K1	CO1	Have knowledge of general structure, characteristics and behavior of matter in whichever phase they are in
K2	CO2	Have knowledge of effect of external application of force and torque and also understanding the underlying theory in it
K3	CO3	To find the application of above mentioned behavior in innovative research work
K4	CO4	Realize the conceptual understanding of the facts through implications of Quantum statistical concept.

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	L

H – High; M – Medium; L – Low

20UPS615 Microprocessor Mechanisms & Programming in C

Course Objective

To develop the skill to gain knowledge in Programming in C & Information Security

Course Outcomes (CO)

K1	CO1	To apply the knowledge of various instruction set of the Microprocessor Intel 8085 in solving simple programmes
K2	CO2	To remember the basic concepts of C programming language
K3	CO3	To understand the role of control statements in C
K4	CO4	To apply the concept of functions,structures and pointers in C

Mapping

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

H – High; M – Medium; L – Low

20UPS616 Electronics Lab

Course objective

- To provide a basic grounding in the field of Electronics and to serve as a hint for the student to the more advance techniques.

Course outcomes

K3	CO1	To gain knowledge of electronics
K4	CO2	To familiarize with the electronic circuits through experiment
K5	CO3	To understand the operation of amplifiers, oscillators etc

Mapping

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

H – High; M – Medium; L – Low

- To be acquainted with the basics and working of Electronic Digital circuits and Microprocessor.

Course outcomes

K3	CO1	Determine the behavior of a digital logic circuit
K4	CO2	Translate the Boolean equations/expressions to efficient combinational and sequential circuits.
K5	CO3	Write simple programmes to run an 8085 microprocessor.

Mapping

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

H- High; M- Medium; L- Low

20UPS618 Computer Lab in C

Course Objective

To develop the skill to gain knowledge in C

Course Outcomes (CO)

K3	CO1	To keep in mind the basics of C programming
K4	CO2	To understand and become familiar with C programs
K5	CO3	To verify the concepts through simple programs

Mapping

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

H – High; M – Medium; L – Low

HoD

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ProgrammeCode:	M.Sc.PHY			Programme Title:	MasterofPhysics	
CourseCode:	21PPS101			**Title**	**Batch:**	2021– 2023
				Core	**Semester:**	I
LectureHrs./Week or PracticalHrs./Week	5	**TutorialHrs./Sem.**	-	I:Mathematic alPhysics	**Credits:**	4

CourseObjective

Tolearnthemathematicalconceptsandtoolsrequiredtosolvetheproblemsrelatedtophysicsandtodeveloptheskills essential forsolvingadvanced problemsintheoretical physics

CourseOutcomes

Onthesuccessfulcompletion ofthecourse, studentswillbeable to

CO Number	COStatement	Knowledge Level
CO1	Understandthebasicelementsofcomplexanalysis,importantdifferentialandintegra ltheorems,Fourier andLaplacetransforms.	K1/ K2
CO2	Apply the mathematical skills to solve quantitative problems related to theapplications ofphysics	K3
CO3	Analyzetheproblemsinvariousdomainsofphysicstochooseappropriatemethodofs pecial differentialequationsand special integrals	K4
CO4	Evaluate thecomplicateddifferentialsandintegralsusingspecialfunctionssuchasLegendre, Bessel, Hermite, betaandgamma functions	K5
CO5	Formulatingdifferentmathematicalmethodsandphysicallawsintermsofcomplexa nalysis andtensorswith 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

ProgrammeCode:	M.Sc.PHY		Programme Title:		MasterofPhysics
CourseCode:	21PPS102		Title	Batch:	2021 – 2023
			Core II:Classic alMechani cs	Semester:	I
LectureHrs./Week orPractica lHrs./Week	5	TutorialHrs./Sem.	-	Credits:	4

CourseObjective

To gain knowledge and understanding oflagrangian and Hamiltonian formulations of mechanics and to applythemto simple systems.

CourseOutcomes

Onthesuccessfulcompletionofthecourse,studentswillbeableto

CO Number	COStatement	Knowledge Level
CO1	Understandthe relationbetweensymmetryoperationandclassicalconservationlaws	K1
CO2	Getclearunderstandingofrecentintricatetheoriesofmodern physics	K2
CO3	Tacklethenewproblemand applythetechniquesofclassical mechanicstofar-flung reachesofscience	K3
CO4	Providesmoothtransition fromtraditionaltechniques torapidlygrowing areaofnon-lineardynamicsandchaos	K4
CO5	Learnmanyconceptsand keypointswhichwill alsobe used inother subjects ofphysics.	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

ProgrammeCode:	M.Sc.PHY			Programme Title:		MasterofPhysics	
CourseCode:	21PPS103			Title	Batch:	2021 – 2023	
				Core	Semester:	I	
LectureHrs./Week or PracticalHrs./Week	5	TutorialHrs./Sem.	-	III:Statisti calMechan ics	Credits:	4	

CourseObjective

Torecognizethepropertiesofmacroscopicandmicroscopicsystemswiththeknowledgeofthepropertiesofindividualparticlesusing classical and quantum statistics

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understandtheconnectionbetweenconceptsofstatisticalmechanicsandthermodynamics	K1/ K2
CO2	Applythetheoriesofstatisticalmechanicstothecalculationofmacroscopicpropertiesresultingfrommicroscopic models	K3
CO3	Identifythestrengthandlimitationsof themodelsusedandbeabletocomparedifferentmicroscopic models	K4
CO4	Attainananalyticabilitytosolveproblemsrelevanttostatisticalmechanics	K5
CO5	Formulatestatisticalmodelsofmorerealisticsystemsinstatisticalphysicsandothercoreareas 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

ProgrammeCode:	M.Sc.PHY		Programme Title:	MasterofScience	
CourseCode:	21PPS1E1		Title	Batch:	2021 – 2023
			Core Elective I - Applied Electronics	Semester:	I
LectureHrs./Week	5	TutorialHrs./Sem.	-	Credits:	5

CourseObjective

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

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Acquirethebasicknowledgeinsemiconductordevicesandtheir applications	K1/K2
CO2	Applytheelectronicprinciplestodevelopcircuitsfordifferent outputs	K3
CO3	Analyzetheelectroniccircuitsystemsandtroubleshootthemfor properworking	K4
CO4	Explaintheapplicationofcircuitconfigurationsandidentifytypeof electronic component usedforproperoperationof circuits	K5
CO5	Designoscillatorsandmulti-vibratorswiththeacquiredknowledge onelectronics	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

ProgrammeCode:		M.Sc.PHY		Programme Title:		MasterofScience	
CourseCode:		21PPS204		**Title**	**Batch:**	2021 – 2023	
				CoreIV: QuantumM echanicsI	**Semester:**	II	
LectureHrs./Week	5	**TutorialHrs./Sem.**			**Credits:**	4	

CourseObjective

To understand the basic concepts and formalisms in Quantum mechanics and solve eigen value problems byapplyingapproximationmethods

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understandthecoreconceptsandabstractformalismofquantum mechanicsandthemathematicaltoolsrequiredtoformulateproblems	K1/K2
CO2	Apply themostappropriateapproximationmethodstoobtain solutionfor1D,3DEigenvalueproblem	K3
CO3	Analyze the role of various quantum mechanical phenomena e.g.angularmomentum,scatteringtheoryinmodernphysicsandtechnology,Comparetheproperties,establishtherelations betweenthem,Interpretandvalidatetheresults	K4
CO4	Assimilateallthecomponentsofcourseandselectacorrect methodtofindsolutionforvariousproblemsof atomicand moleculardimensions	K5
CO5	Incorporaterelevanttoolsandmethodologiesofthecoursetoexhibittheskills to test theideas andsolve complexities	K6

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
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

ProgrammeCode:	M.Sc.PHY		Programme Title:	MasterofPhysics	
CourseCode:	21PPS205		Title	Batch:	2021 – 2023
			Core V:Electromagne tictheory &Electrodynami cs	Semester:	II
LectureHrs./Week or PracticalHrs./Week	5	TutorialHrs./Sem.	-	Credits:	4

CourseObjective

Todevelopthebasic knowledgeaboutelectromagneticfield andplasmaphysics

CourseOutcomes

Onthesuccessfulcompletion ofthecourse,students willbeable to

CO Number	COStatement	Knowledge Level
CO1	Recollectthebasicideasaboutelectric,magnetic fields	K1
CO2	Understandthe applicationsofelectromagneticfield	K2
CO3	AnalyzeincompletionofAmpere'slawandcompletionofMaxwell'sequation	K4
CO4	Enhancedskillinsolvingproblemsbyapplyingelectromagneticfieldexpressions	K5
CO5	Promotefundamentalideasof theunified electromagnetictheorywhich is presenteverywhere	K6

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
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

ProgrammeCode:	M.Sc.PHY			Programme Title:	MasterofScience	
CourseCode:	21PPS206			Title	Batch:	2021-2023
				Core VI:Condensed MatterPhysics	Semester:	II
LectureHrs./Week or PracticalHrs./Week	5	Tutorial Hrs./Sem.	-		Credits:	4

CourseObjective

Toprovidecoherentperspectiveofthephysicalconceptsandtheoriesrelatedwiththecharacterizationofmaterials

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understandthedepthinformationofcrystalstructures	K2
CO2	Applyknowledgeofcrystallographictechniquestoelucidatethevariousproperties in thesolid-statephysics	K3
CO3	Analyze the different properties like electric, magnetic and thermal anddeveloptheskills forresearch	K4
CO4	Evaluatethepossibilityofsuperconductorsinindustryandmedicalapplications	K5
CO5	Createnewmaterialsbasedon afundamentalunderstandingoftheirproperties	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

ProgrammeCode:		M.Sc.PHY		Programme Title:	MasterofScience	
CourseCode:		21PPS2E3		**Title**	**Batch:**	2021 – 2023
				Core Elective II:ElectronicCo mmunicationsan dCyber security	**Semester:**	II
LectureHrs./Week	5	**TutorialHrs./Sem.**			**Credits:**	4

CourseObjective

TodevelopthescientificskillsintheElectronicCommunicationSystemsandCyberSecurity

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understandthevariousmodulationtechniquesandthegenerationofmicrowave sand concepts of internetcyber security	K1/K2
CO2	Applythebasicphysicalconceptsinanalog,pulseanddigitalcommunication	K3
CO3	Implementthemodulationtechniquesinthecommunicationsystems	K4
CO4	Evaluatethecriticalproblemsincommunicationsystems	K5
CO5	Createthenewdigitaltransmissioncircuitsusedtomodulatethesignals	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

ProgrammeCode:	M.Sc.PHY		Programme Title:	MasterofPhysics	
CourseCode:	21PPS207		Title	Batch:	2021 – 2023
			Core	Semester:	I& II
LectureHrs./Week or PracticalHrs./Week	4	TutorialHrs./Sem.	-	VII:GeneralPhysicsLabI	Credits:	4

CourseObjective

Todeveloptheskilltogainknowledgeinexperimentaltechniques

CourseOutcomes

Onthesuccessfulcompletion ofthecourse,students willbeable to

CO Number	COStatement	Knowledge Level
CO1	Understandandfamiliarizewiththebasicsofexperimentalphysics	K1/K2
CO2	Applythe knowledgeinperformingtheeexperiments	K3
CO3	Analyzethe workingof the apparatus	K4
CO4	Evaluateand comparetheexperimentalresults withtheoreticalvalues	K5
CO5	Designnew experimental set upto validate thetheory	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

ProgrammeCode:	M.Sc.PHY			Programme Title:		MasterofPhysics	
CourseCode:	21PPS208			Title		Batch:	2021 – 2023
				Core		Semester:	I& II
LectureHrs./Week or PracticalHrs./Week	4	TutorialHrs./Sem.	-	VIII:Electronics LabI		Credits:	4

CourseObjective

- Tounderstandtheworkingofsemiconductordevices,amplifiersand oscillators.

CourseOutcomes

Onthesuccessfulcompletion ofthecourse,students willbeable to

CO Number	COStatement	Knowledge Level
CO1	Procure the knowledge of characteristics ofsemiconductordevices	K1/K2
CO2	Applythebasicprinciplesofelectronicstoverifythevari ousdevicecharacteristics	K3
CO3	Analyze the theory of transistors, capacitors, resistorsandimplement theknowledgewithworkablecirciuts	K4
CO4	TroubleshootthecombinationalcircuitsusingdigitalIC 's	K5
CO5	Develop the devices like regulated power supply byusingthe principles ofelectronics	K6

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
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

ProgrammeCode:	M.Sc.PHY		**Programme Title:**	MasterofPhysics	
CourseCode:	21PPS2N1		**Title**	**Batch:**	2021 – 2023
			NonMajorElective:	**Semester:**	II
LectureHrs./Week or PracticalHrs./Week	1	**TutorialHrs./Sem.** -	Non ConventionalEnergy Sources	**Credits:**	2

CourseObjective

Tostudythebasicconcepts and applications of nonconventional energysources

CourseOutcomes

Onthesuccessfulcompletion ofthecourse,students willbeable to

CO Number	COStatement	Knowledge Level
CO1	Recollecttheapplicationsofphysicsinrealworld	K1
CO2	Understandtheprinciplesofphysicsinvolvingvariousnaturalandartificial process	K2
CO3	Recognizetheneed ofnonconventional energysources	K3
CO4	Implementthebasicslawsofphysicsin thefieldofnonconventionalenergysources	K3
CO5	Analyzethe efficiencyofdevicesandinstruments usedintheproductionofenergy	K4

Mapping

PO/PSO CO	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

ProgrammeCode:	M.Sc.PHY			Programme Title:		Masterofscience	
CourseCode:	21PPS2N2			Title	Batch:	2021-2023	
				Non MajorElective :BiomedicalIns trumentation	Semester:	II	
LectureHrs./Week or PracticalHrs./Week	1	TutorialHrs./Sem.	-		Credits:	2	

CourseObjective

Toapplyknowledgeof physics in thefield ofbiomedical instrumentation

CourseOutcomes

Onthesuccessfulcompletion ofthecourse,students willbeable to

CO Number	COStatement	Knowledge Level
CO1	Recollectthebasicsof physicsrelatedto biology	K1
CO2	Acquirethepriorknowledgeoffundamentalconcepts,functioningandapplicationsof physiological devices.	K2
CO3	Implementtheknowledgeinthe constructionandoperationofinstruments	K3
CO4	Analyzetheprocessofoperation	K4
CO5	Evaluatethe technologiesandmodel usedin thebiomedical 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

ProgrammeCode:	M.Sc.PHY		Programme Title:	MasterofScience	
CourseCode:	21PPS309		Title	Batch:	2021 – 2023
			CoreX: QuantumMechanicsII	Semester:	III
LectureHrs./Week	5	TutorialHrs./Sem.		Credits:	4

CourseObjective

To familiarize with advanced concepts and methodology of quantum mechanics,quantization offieldsand central forceproblems

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Demonstrateunderstandingofbasicprinciplesofquantum,conceptsandterminologyofQuantummechanicsandtheirapplications to various physical and chemical problems and gain aninsightin the quantum field theory	K1/K2
CO2	Apply the concepts of quantum mechanics to quantitatively predictthebehaviorofphysicalSystemssuchasAtomic,Nuclear,Molecular,Solid stateand statistical physics	K3
CO3	Analyzeandapplythemodernquantummechanicalmethodsfordeterminingelectronicstructureofmolecules andatoms	K4
CO4	Integrate several components to find solution to the problems inMolecularandelementaryparticlephysicsbychoosinganappropriate theoretical method	K5
CO5	Adopt systematic methodology and relevant tool to find solution toproblemsofmodernphysics,interpretthefindingsandcommunicatetheresults effectively	K6

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
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

H–High; M –Medium;L–Low

ProgrammeCode:	M.Sc.PHY		Programme Title:	MasterofPhysics	
CourseCode:	21PPS310		Title	Batch:	2021 – 2023
			Core	Semester:	III
LectureHrs./Week orPractica lHrs./Week	5	TutorialHrs./Sem.	IX:Molecula rSpectroscop y -	Credits:	4

CourseObjective

Todevelop theskill togain knowledgein grouptheoryanddifferent spectroscopictechniques

CourseOutcomes

Onthesuccessfulcompletionofthecourse,studentswillbeableto

CO Number	COStatement	Knowledge Level
CO1	Understandthesymmetryofmoleculesandprincipleofdifferentspectroscopic techniques	K1/K2
CO2	Applysymmetryoperations to predict thepoint group ofmolecules	K3
CO3	AnalyzethedifferentmotionsofmoleculesandpredictMicrowave,IRand Ramanactivity	K4
CO4	Evaluatetheconditions forresonancein NMR,ESR,NQR andMossbauer Spectroscopy	K5
CO5	CreateacharactertableandpredictIRandRamanactivityfornew 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

ProgrammeCode:	M.Sc.PHY		Programme Title:	MasterofScience	
CourseCode:	21PPS3E5		Title	Batch:	2021 – 2023
			CoreElective III:Thinfilm & Nanoscience	Semester:	III
LectureHrs./Week	5	TutorialHrs./Sem.	-	Credits:	5

CourseObjective

TodeveloptheknowledgeaboutfundamentalsofThin FilmandNanoscience

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understand the concepts of Growth process of Thin filmmaterials and familiarize with the basics of NanotechnologyandQuantum structure	K1/K2
CO2	Applythevarious methodologies to fabricatematerials	K3
CO3	Categorizethematerialsaccordingtotheirsize	K4
CO4	Summarize the various properties of thin materials andnanomaterialsusingseveralcharacterizationtechniqu es	K5
CO5	Synthesis thin-film materials and nano-materials for severalapplications	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

ProgrammeCode:	M.Sc.PHY			Programme Title:	MasterofPhysics	
CourseCode:	21VAD301			Title	Batch:	2021 – 2023
				Value AddedCourse: PythonProgramming	Semester:	III
LectureHrs./Week or PracticalHrs./Week	-	TutorialHrs./Sem.	-		Credits:	GRADE

CourseObjective

TointroducePythonprogrammingtosolvescientificandtechnologicalproblems

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Acquiretheknowledgetoanalyzethe problem	K1/ K2
CO2	Plantowritethealgorithmof aprogramwiththe knowledgeof mathematicaloperators,logical operators, conditionaland loopingstatements	K3
CO3	Analyzetheproblemsinvariousdomainsofphysicstowritetheprogramusingpython codes	K4
CO4	Explainclearlytheimportanceofdifferentfunctionstatementsandpasstheargument sbetween functions	K5
CO5	Deviceandcompilethepythonprogrammingforapplicationinthefieldofscience 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

ProgrammeCode:	M.Sc.PHY			Programme Title:		MasterofPhysics
CourseCode:	21PPS411			**Title**	**Batch:**	2021 – 2023
				CoreXI:Lasers & Non-LinearOptics	**Semester:**	IV
LectureHrs./Week or PracticalHrs./Week	5	**TutorialHrs./Sem.**	-		**Credits:**	4

CourseObjective

Todeveloptheskilltogain knowledgeinthebasic principles of LaserandNon-linearoptics

CourseOutcomes

Onthesuccessfulcompletion ofthecourse,students willbeable to

CO Number	COStatement	Knowledge Level
CO1	Understandthebasicprincipleoflaseranditsinteractionwithmatter	K1/K2
CO2	Applytheprincipleanddemonstratetheworkingofdifferenttypes of Lasers	K3
CO3	Analyzetheperformanceof laser andimprovethequality	K4
CO4	Evaluatetherole oflaserin nonlinearoptics	K5
CO5	Design aQ-switchedlaserfornonlinearopticalstudies	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

ProgrammeCode:	M.Sc.PHY			Programme Title:	MasterofScience	
CourseCode:	21PPS412			Title	Batch:	2021-2023
				Core XII:Nuclear &ParticlePhysics	Semester:	IV
LectureHrs./Week or PracticalHrs./Week	5	Tutorial Hrs./Sem.	-		Credits:	4

CourseObjective

Tostudythenuclearstructureand propertiesof nucleithrough nuclear models

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Acquirebasicknowledgeontheproperties,structureofnucleusandnuclear reactions	K1
CO2	Understandthepropertiesandsignificanceofstablenucleusthroughdifferenttypes of nuclearmodels	K2
CO3	Applythebasicconceptsintheclassificationofelementaryparticleslikequarks, Higgs bosons	K3
CO4	Analyzeproblemsolvingskillsinnuclearphysicsandpaveawaytoresearchin nuclear physics	K4
CO5	Evaluatethefundamental propertiesofelementaryparticles,aswellassymmetriesand thestandard 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

ProgrammeCode:	M.Sc.PHY			Programme Title:		Masterofscience	
CourseCode:	21PPS4E7			Title	**Batch:**	2021-2023	
				Core Elective IV:Microprocesso r &Object-OrientedProgram mingwithC++	**Semester:**	IV	
LectureHrs./Week or PracticalHrs./Week	5	**TutorialHrs./Sem.**	-		**Credits:**	5	

CourseObjective

- Toacquireknowledgeaboutmicroprocessorandobject-orientedprograms

CourseOutcomes

Onthesuccessfulcompletion ofthecourse,students willbeable to

CO Number	COStatement	Knowledge Level
CO1	AcquiretheknowledgeofvariousinstructionsetoftheMicroprocessorIntel 8085	K1/K2
CO2	ApplythevariousC++functionaloperatorstobuildasecureprogram	K3
CO3	Analyzethemethodofinterfacingofdifferentprogrammabledevices	K4
CO4	SolveproblemsinPhysicsbasedonMicroprocessorand OOPS	K5
CO5	Design programs based on microprocessor forvarious applications like traffic light controller,steppermotor,A/DConverterandD/AConverter	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

ProgrammeCode:	M.Sc.PHY			Programme Title:		MasterofPhysics	
CourseCode:	21PPS413			**Title**		**Batch:**	2021 – 2023
				Core		**Semester:**	III&IV
LectureHrs./Week or PracticalHrs./Week	4	**TutorialHrs./Sem.**	-	XIII:General PhysicsLabII		**Credits:**	5

CourseObjective

ToachieveapracticalknowledgebyapplyingtheexperimentalmethodstocorrelatewiththePhysicstheoryandanalyzethe experimental data

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understandthetheoreticalconceptsbehindeveryexperimentalmethods	K1/ K2
CO2	ApplytheKnowledgeoftheoryandanalyticaltechniquestointerpretexperimentaldata	K3
CO3	Analyzetheexperimentalresultswithmathematicalconceptstoobtainquantitativeresults	K4
CO4	Communicatetheprocedureand outcomesof anexperiment	K5
CO5	Designnewmethodologytoperformanexperimentwiththepossibleequipmentin 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

ProgrammeCode:	M.Sc.PHY		Programme Title:	MasterofScience	
CourseCode:	21PPS414		**Title**	**Batch:**	2021 – 2023
			CoreXIV:	**Semester:**	III& IV
LectureHrs./Week	4	**TutorialHrs./Sem.** -	Electronics LabII	**Credits:**	5

CourseObjective

Toknowtheactionandapplicationsofoperationalamplifierandtobecomefamiliarizewith8085microprocessor

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	GainknowledgeandunderstandingofIC'SandMicroprocessor 8085	K2
CO2	Applythetheoreticalknowledgeandskilltodesigncircuit,make measurements,analyze andinterprettheexperimentaldata.	K3
CO3	Enhancethelogicalthinkingandabilitybywritingsimpleprogrammesusi ng8085microprocessorandemploythetechnical expertiseforinterfacingdevices	K4
CO4	Incorporateallthenecessarytools andskills todevisepractical circuitsthatperformdesiredoperations	K5
CO5	AbilitytoAugmentthepresentdayrequirementsinindustriesand research fields by developing their own firm or fetch anemploymentasaD esignengineer	K6

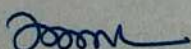## Mapping

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

ProgrammeCode:		M.Sc.PHY		Programme Title:		MasterofScience
CourseCode:		21PPS415		**Title**	**Batch:**	2021 – 2023
				CoreXV:	**Semester:**	IV
LectureHrs./Week	2	**TutorialHrs./Sem.**	-	ComputerL abinC++	**Credits:**	3

CourseObjective

Toacquirebasicknowledgein object orientedprogramming

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Toremember thebasic C++language	K1/ K2
CO2	Toapplytheconceptsand benefits of OOPs	K3
CO3	ToanalyzethefunctionsofvariousC++operators	K4
CO4	ToevaluatetheC++languageto solveproblems inPhysics	K5
CO5	TocreatetheC++languageprograms	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

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ProgrammeCode:	M.Sc.PHY			Programme Title:	MasterofPhysics	
CourseCode:	21PPS416			Title	Batch:	2021 – 2023
				CoreXVI:Project	Semester:	III&IV
LectureHrs./Week or PracticalHrs./Week	3	TutorialHrs./Sem.	-		Credits:	8

VerifiedbyHOD	CheckedbyCDC	Approved by COE
Name:Dr.T.E.Manju lavalli	Name: Mr.K.Srinivasan	Name: Dr.R.ManickaChezian
Signature:	Signature:	Signature:

HoD

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ProgrammeCode:	M.Sc.PHY		Programme Title:		MasterofPhysics	
CourseCode:	22PPS101		Title	Batch:	2022– 2024	
			Core	Semester:	I	
LectureHrs./Weekor PracticalHrs./Week	5	TutorialHrs./Sem.	-	I:Mathematic alPhysics	Credits:	4

CourseObjective

Tolearnthemathematicalconceptsandtoolsrequiredtosolvetheproblemsrelatedtophysicsandtodeveloptheskills essential forsolvingadvanced problemsintheoretical physics

CourseOutcomes

Onthesuccessfulcompletion ofthecourse, studentswillbeable to

CO Number	COStatement	Knowledge Level
CO1	Understandthebasicelementsofcomplexanalysis,importantdifferentialandintegra ltheorems,Fourier andLaplacetransforms.	K1/ K2
CO2	Apply the mathematical skills to solve quantitative problems related to theapplications ofphysics	K3
CO3	Analyzetheproblemsinvariousdomainsofphysicstochooseappropriatemethodofs pecial differentialequationsand special integrals	K4
CO4	Evaluate thecomplicateddifferentialsandintegralsusingspecialfunctionssuchasLegendre, Bessel, Hermite, betaandgamma functions	K5
CO5	Formulatingdifferentmathematicalmethodsandphysicallawsintermsofcomplexa nalysis andtensorswith 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

ProgrammeCode:	M.Sc.PHY			Programme Title:	MasterofPhysics	
CourseCode:	22PPS102			**Title**	**Batch:**	2022 – 2024
				Core	**Semester:**	I
LectureHrs./Week orPracticalHrs./Week	5	**TutorialHrs./Sem.**	-	**II:**ClassicalMechanics	**Credits:**	4

Course Objective

To gain knowledge and understanding oflagrangian and Hamiltonian formulations of mechanics and to applythemto simple systems.

Course Outcomes

Onthesuccessfulcompletionofthecourse,studentswillbeableto

CO Number	CO Statement	Knowledge Level
CO1	Understandthe relationbetweensymmetryoperationandclassicalconservationlaws	K1
CO2	Getclearunderstandingofrecentintricatetheoriesofmodern physics	K2
CO3	Tacklethenewproblemand applythetechniquesofclassical mechanicstofar-flung reachesofscience	K3
CO4	Providesmoothtransition fromtraditionaltechniques torapidlygrowing areaofnon-lineardynamicsandchaos	K4
CO5	Learnmanyconceptsand keypointswhichwill alsobe used inother subjects ofphysics.	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

ProgrammeCode:	M.Sc.PHY		Programme Title:	MasterofPhysics	
CourseCode:	22PPS103		Title	Batch:	2022 – 2024
			Core III:Statisti calMechan ics	Semester:	I
LectureHrs./Week or PracticalHrs./Week	5	TutorialHrs./Sem.	-	Credits:	4

CourseObjective

Torecognizethepropertiesofmacroscopicandmicroscopicsystemswiththeknowledgeofthepropertiesofindividualp articlesusing classical and quantum statistics

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understandtheconnectionbetweenconceptsofstatisticalmechanicsandthermodyn amics	K1/ K2
CO2	Applythetheoriesofstatisticalmechanicstothecalculationofmacroscopicpropertie sresultingfrommicroscopic models	K3
CO3	Identifythestrengthandlimitationsof themodelsusedandbeabletocomparedifferentmicroscopic models	K4
CO4	Attainananalyticabilitytosolveproblemsrelevanttostatisticalmechanics	K5
CO5	Formulatestatisticalmodelsofmorerealisticsystemsinstatisticalphysicsandotherc oreareas 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

ProgrammeCode:	M.Sc.PHY		Programme Title:	MasterofScience	
CourseCode:	22PPS1E1		**Title**	**Batch:**	2022 – 2024
			Core Elective I - Applied Electronics	**Semester:**	I
LectureHrs./Week	5	**TutorialHrs./Sem.**	-	**Credits:**	5

CourseObjective

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

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Acquirethebasicknowledgeinsemiconductordevicesandtheir applications	K1/K2
CO2	Applytheelectronicprinciplestodevelopcircuitsfordifferent outputs	K3
CO3	Analyzetheelectroniccircuitsystemsandtroubleshootthemfor properworking	K4
CO4	Explaintheapplicationofcircuitconfigurationsandidentifytypeof electronic component usedforproperoperationof circuits	K5
CO5	Designoscillatorsandmulti-vibratorswiththeacquiredknowledge onelectronics	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

ProgrammeCode:	M.Sc.PHY		Programme Title:	MasterofScience	
CourseCode:	22PPS204		**Title**	**Batch:**	2022 – 2024
			CoreIV: Foundation of QuantumMechanics	**Semester:**	II
LectureHrs./Week	5	**TutorialHrs./Sem.**		**Credits:**	4

CourseObjective

To understand the basic concepts and formalisms in Quantum mechanics and solve eigen value problems byapplyingapproximationmethods

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understandthecoreconceptsandabstractformalismofquantum mechanicsandthemathematicaltoolsrequiredtoformulateproblems	K1/K2
CO2	Apply themostappropriateapproximationmethodstoobtain solutionfor1D,3DEigenvalueproblem	K3
CO3	Analyze the role of various quantum mechanical phenomena e.g.angularmomentum,scatteringtheoryinmodernphysicsandtechnology,Comparetheproperties,establishtherelations betweenthem,Interpretandvalidatetheresults	K4
CO4	Assimilateallthecomponentsofcourseandselectacorrect methodtofindsolutionforvariousproblemsof atomicand moleculardimensions	K5
CO5	Incorporaterelevanttoolsandmethodologiesofthecoursetoexhibittheskills to test theideas andsolve complexities	K6

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
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

ProgrammeCode:	M.Sc.PHY			Programme Title:		MasterofPhysics	
CourseCode:	22PPS205			Title	**Batch:**	2022 – 2024	
				Core	**Semester:**	II	
LectureHrs./Week or PracticalHrs./Week	5	TutorialHrs./Sem.	-	V:Electromagne tictheory &Electrodynami cs	**Credits:**	4	

CourseObjective

Todevelopthebasic knowledgeaboutelectromagneticfield andplasmaphysics

CourseOutcomes

Onthesuccessfulcompletion ofthecourse,students willbeable to

CO Number	COStatement	Knowledge Level
CO1	Recollectthebasicideasaboutelectric,magnetic fields	K1
CO2	Understandthe applicationsofelectromagneticfield	K2
CO3	Analyzeincompletionof Ampere'slawandcompletionofMaxwell'sequation	K4
CO4	Enhancedskillinsolvingproblemsbyapplyingelectromagneticfieldexpr essions	K5
CO5	Promotefundamentalideasof theunified electromagnetictheorywhich is presenteverywhere	K6

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
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

ProgrammeCode:	M.Sc.PHY			Programme Title:	MasterofScience	
CourseCode:	22PPS206			Title	Batch:	2022-2024
LectureHrs./Week or PracticalHrs./Week	5	Tutorial Hrs./Sem.	-	Core VI:Condensed MatterPhysics	Semester:	II
					Credits:	4

CourseObjective

Toprovidecoherentperspectiveofthephysicalconceptsandtheoriesrelatedwiththecharacterizationofmaterials

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understandthedepthinformationofcrystalstructures	K2
CO2	Applyknowledgeofcrystallographictechniquestoelucidatethevariousproperties in thesolid-statephysics	K3
CO3	Analyze the different properties like electric, magnetic and thermal anddeveloptheskills forresearch	K4
CO4	Evaluatethepossibilityofsuperconductorsinindustryandmedicalapplications	K5
CO5	Createnewmaterialsbasedon afundamentalunderstandingoftheirproperties	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

ProgrammeCode:		M.Sc.PHY		Programme Title:		MasterofScience	
CourseCode:		22PPS2E3		Title	Batch:	2022 – 2024	
				Core Elective II:ElectronicCommunicationsandCyber security	Semester:	II	
LectureHrs./Week	5	TutorialHrs./Sem.			Credits:	4	

CourseObjective

TodevelopthescientificskillsintheElectronicCommunicationSystemsandCyberSecurity

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understandthevariousmodulationtechniquesandthegenerationofmicrowavesand concepts of internetcyber security	K1/K2
CO2	Applythebasicphysicalconceptsinanalog,pulseanddigitalcommunication	K3
CO3	Implementthemodulationtechniquesinthecommunicationsystems	K4
CO4	Evaluatethecriticalproblemsincommunicationsystems	K5
CO5	Createthenewdigitaltransmissioncircuitsusedtomodulatethesignals	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

ProgrammeCode:	M.Sc.PHY			Programme Title:		MasterofPhysics	
CourseCode:	22PPS2N1			Title		Batch:	2022 – 2024
				NonMajorElective:		Semester:	II
LectureHrs./Week or PracticalHrs./Week	1	TutorialHrs./Sem.	-	Non ConventionalEnergy Sources		Credits:	2

CourseObjective

Tostudythebasicconcepts and applications of nonconventional energysources

CourseOutcomes

Onthesuccessfulcompletion ofthecourse,students willbeable to

CO Number	COStatement	Knowledge Level
CO1	Recollecttheapplicationsofphysicsinrealworld	K1
CO2	Understandtheprinciplesofphysicsinvolvingvariousnaturalandartificial process	K2
CO3	Recognizetheneed ofnonconventional energysources	K3
CO4	Implementthebasicslawsofphysicsin thefieldofnonconventionalenergysources	K3
CO5	Analyzethe efficiencyofdevicesandinstruments usedintheproductionofenergy	K4

Mapping

PO/PSO CO	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

ProgrammeCode:	M.Sc.PHY		Programme Title:	Masterofscience	
CourseCode:	22PPS2N2		Title	Batch:	2022-2024
			Non MajorElective :BiomedicalIns trumentation	Semester:	II
LectureHrs./Week or PracticalHrs./Week	1	TutorialHrs./Sem.	-	Credits:	2

CourseObjective

Toapplyknowledgeof physics in thefield ofbiomedical instrumentation

CourseOutcomes

Onthesuccessfulcompletion ofthecourse,students willbeable to

CO Number	COStatement	Knowledge Level
CO1	Recollectthebasicsof physicsrelatedto biology	K1
CO2	Acquirethepriorknowledgeoffundamentalconcepts,functioningandapplicationsof physiological devices.	K2
CO3	Implementtheknowledgeinthe constructionandoperationofinstruments	K3
CO4	Analyzetheprocessofoperation	K4
CO5	Evaluatethe technologiesandmodel usedin thebiomedical 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

ProgrammeCode:	M.Sc.PHY			Programme Title:	MasterofPhysics	
CourseCode:	22PPS207			Title	Batch:	2022 – 2024
				Core	Semester:	I& II
LectureHrs./Week or PracticalHrs./Week	4	TutorialHrs./Sem.	-	VII:GeneralPhysicsLabI	Credits:	4

CourseObjective

Todeveloptheskilltogainknowledgeinexperimentaltechniques

CourseOutcomes

Onthesuccessfulcompletion ofthecourse,students willbeable to

CO Number	COStatement	Knowledge Level
CO1	Understandandfamiliarizewiththebasicsofexperimentalphysics	K1/K2
CO2	Applythe knowledgeinperformingtheexperiments	K3
CO3	Analyzethe workingof the apparatus	K4
CO4	Evaluateand comparetheexperimentalresults withtheoreticalvalues	K5
CO5	Designnew experimental set upto validate thetheory	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

ProgrammeCode:	M.Sc.PHY			Programme Title:		MasterofPhysics	
CourseCode:	22PPS208			**Title**		**Batch:**	2022 – 2024
				Core		**Semester:**	I& II
LectureHrs./Week or PracticalHrs./Week	4	**TutorialHrs./Sem.**	-	VIII:Electronics LabI		**Credits:**	4

CourseObjective

- Tounderstandtheworkingofsemiconductordevices,amplifiersand oscillators.

CourseOutcomes

Onthesuccessfulcompletion ofthecourse,students willbeable to

CO Number	COStatement	Knowledge Level
CO1	Procure the knowledge of characteristics ofsemiconductordevices	K1/K2
CO2	Applythebasicprinciplesofelectronicstoverifythevarious devicecharacteristics	K3
CO3	Analyze the theory of transistors, capacitors, resistorsandimplement theknowledgewithworkablecirciuts	K4
CO4	TroubleshootthecombinationalcircuitsusingdigitalIC's	K5
CO5	Develop the devices like regulated power supply byusingthe principles ofelectronics	K6

Mapping

PO/PSO CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
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

ProgrammeCode:	M.Sc.PHY		Programme Title:	MasterofScience	
CourseCode:	22PPS309		**Title**	**Batch:**	2022 – 2024
			CoreX:	**Semester:**	III
LectureHrs./Week	5	**TutorialHrs./Sem.**	Advanced Quantum Mechanics	**Credits:**	4

CourseObjective

To familiarize with advanced concepts and methodology of quantum mechanics,quantization offieldsand central forceproblems

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Demonstrateunderstandingofbasicprinciplesofquantum,conceptsan dterminologyofQuantummechanicsandtheirapplications to various physical and chemical problems and gain aninsightin the quantum field theory	K1/K2
CO2	Apply the concepts of quantum mechanics to quantitatively predictthebehaviorofphysicalSystemssuchasAtomic,Nuclear,Molec ular,Solid stateand statistical physics	K3
CO3	Analyzeandapplythemodernquantummechanicalmethodsfordetermi ningelectronicstructureofmolecules andatoms	K4
CO4	Integrate several components to find solution to the problems inMolecularandelementaryparticlephysicsbychoosinganappropriate theoretical method	K5

CO5	Adopt systematic methodology and relevant tool to find solution toproblemsofmodernphysics,interpretthefindingsandcommunicatet heresults effectively	K6

Mapping

PO/PSO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PSO1	PSO2
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

H–High; M –Medium;L–Low

ProgrammeCode:	M.Sc.PHY		Programme Title:	MasterofPhysics	
CourseCode:	22PPS310		Title	Batch:	2022 – 2024
			Core IX:Molecula rSpectroscop y	Semester:	III
LectureHrs./Week orPractica lHrs./Week	5	TutorialHrs./Sem.	-	Credits:	4

CourseObjective

Todevelop theskill togain knowledgeingroup theoryand differentspectroscopic techniques

CourseOutcomes

Onthesuccessfulcompletionofthecourse,studentswillbeableto

CO Number	COStatement	Knowledge Level
CO1	Understandthesymmetryofmoleculesandprincipleofdifferent spectroscopic techniques	K1/K2
CO2	Applysymmetryoperations to predict thepoint group ofmolecules	K3
CO3	AnalyzethedifferentmotionsofmoleculesandpredictMicrowave,IRand Ramanactivity	K4
CO4	Evaluatetheconditions forresonancein NMR,ESR,NQR andMossbauer Spectroscopy	K5
CO5	CreateacharactertableandpredictIRandRamanactivityfornew 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

ProgrammeCode:	M.Sc.PHY			Programme Title:	MasterofScience	
CourseCode:	22PPS3E5			Title	Batch:	2022 – 2024
				CoreElective III:Thinfilm & Nanoscience	Semester:	III
LectureHrs./Week	5	TutorialHrs./Sem.	-		Credits:	5

CourseObjective

TodeveloptheknowledgeaboutfundamentalsofThin FilmandNanoscience

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understand the concepts of Growth process of Thin filmmaterials and familiarize with the basics of NanotechnologyandQuantum structure	K1/K2
CO2	Applythevarious methodologies to fabricatematerials	K3
CO3	Categorizethematerialsaccordingtotheirsize	K4
CO4	Summarize the various properties of thin materials andnanomaterialsusingseveralcharacterizationtechniques	K5
CO5	Synthesis thin-film materials and nano-materials for severalapplications	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

ProgrammeCode:	M.Sc.PHY			Programme Title:	MasterofPhysics	
CourseCode:	22VAD301			Title	Batch:	2022 – 2024
				Value AddedCourse: PythonProgramming	Semester:	III
LectureHrs./Week or PracticalHrs./Week	-	TutorialHrs./Sem.	-		Credits:	GRADE

CourseObjective

TointroducePythonprogrammingtosolvescientificandtechnologicalproblems

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Acquiretheknowledgetoanalyzethe problem	K1/ K2
CO2	Plantowritethealgorithmof aprogramwiththe knowledgeof mathematicaloperators,logical operators, conditionaland loopingstatements	K3
CO3	Analyzetheproblemsinvariousdomainsofphysicstowritetheprogramusingpython codes	K4
CO4	Explainclearlytheimportanceofdifferentfunctionstatementsandpasstheargument sbetween functions	K5
CO5	Deviceandcompilethepythonprogrammingforapplicationinthefieldofscience 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

ProgrammeCode:	M.Sc.PHY			Programme Title:		MasterofPhysics	
CourseCode:	22PPS411			Title	Batch:	2022 – 2024	
				CoreXI:Lasers & Non-LinearOptics	Semester:	IV	
LectureHrs./Week or PracticalHrs./Week	5	TutorialHrs./Sem.	-		Credits:	4	

CourseObjective

Todeveloptheskilltogain knowledgeinthebasic principles of LaserandNon-linearoptics

CourseOutcomes

Onthesuccessfulcompletion ofthecourse,students willbeable to

CO Number	COStatement	Knowledge Level
CO1	Understandthebasicprincipleoflaseranditsinteractionwithmatter	K1/K2
CO2	Applytheprincipleanddemonstratetheworkingofdifferenttypes of Lasers	K3
CO3	Analyzetheperformanceof laser andimprovethequality	K4
CO4	Evaluatetherole oflaserin nonlinearoptics	K5
CO5	Design aQ-switchedlaserfornonlinearopticalstudies	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

ProgrammeCode:	M.Sc.PHY			Programme Title:	MasterofScience	
CourseCode:	22PPS412			Title	Batch:	2022-2024
				Core XII:Nuclear &ParticlePhysics	Semester:	IV
LectureHrs./Week or PracticalHrs./Week	5	Tutorial Hrs./Sem.	-		Credits:	4

CourseObjective

Tostudythenuclearstructureand propertiesof nucleithrough nuclear models

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Acquirebasicknowledgeontheproperties,structureofnucleusandnuclear reactions	K1
CO2	Understandthepropertiesandsignificanceofstablenucleusthroughdifferenttypes of nuclearmodels	K2
CO3	Applythebasicconceptsintheclassificationofelementaryparticleslikequarks, Higgs bosons	K3
CO4	Analyzeproblemsolvingskillsinnuclearphysicsandpaveawaytoresearchin nuclear physics	K4
CO5	Evaluatethefundamental propertiesofelementaryparticles,aswellassymmetriesand thestandard 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

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H-High;M-Medium;L-Low

ProgrammeCode:	M.Sc.PHY		Programme Title:	Masterofscience	
CourseCode:	22PPS4E7		Title	Batch:	2022-2024
			Core Elective IV:Microprocessor &Object-OrientedProgrammingwithC++	Semester:	IV
LectureHrs./Week or PracticalHrs./Week	5	TutorialHrs./Sem.	-	Credits:	5

CourseObjective

- Toacquireknowledgeaboutmicroprocessorandobject-orientedprograms

CourseOutcomes

Onthesuccessfulcompletion ofthecourse,students willbeable to

CO Number	COStatement	Knowledge Level
CO1	AcquiretheknowledgeofvariousinstructionsetoftheMicroprocessorIntel 8085	K1/K2
CO2	ApplythevariousC++functionaloperatorstobuildasecureprogram	K3
CO3	Analyzethemethodofinterfacingofdifferentprogrammabledevices	K4
CO4	SolveproblemsinPhysicsbasedonMicroprocessorand OOPS	K5
CO5	Design programs based on microprocessor forvarious applications like traffic light controller,steppermotor,A/DConverterandD/AConverter	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

ProgrammeCode:	M.Sc.PHY		Programme Title:		MasterofPhysics
CourseCode:	22PPS413		Title	Batch:	2022 – 2024
			Core	Semester:	III&IV
LectureHrs./Week or PracticalHrs./Week	4	TutorialHrs./Sem.	-	XIII:General PhysicsLabII	Credits:	5

CourseObjective

ToachieveapracticalknowledgebyapplyingtheexperimentalmethodstocorrelatewiththePhysicstheoryandanalyzethe experimental data

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Understandthetheoreticalconceptsbehindeveryexperimentalmethods	K1/ K2
CO2	ApplytheKnowledgeoftheoryandanalyticaltechniquestointerpretexperimentaldata	K3
CO3	Analyzetheexperimentalresultswithmathematicalconceptstoobtainquantitativeresults	K4
CO4	Communicatetheprocedureand outcomesof anexperiment	K5
CO5	Designnewmethodologytoperformanexperimentwiththepossibleequipmentin 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

ProgrammeCode:	M.Sc.PHY		Programme Title:	MasterofScience	
CourseCode:	22PPS414		Title	Batch:	2022 – 2024
			CoreXIV:	Semester:	III& IV
LectureHrs./Week	4	TutorialHrs./Sem.	- Electronics LabII	Credits:	5

CourseObjective

Toknowtheactionandapplicationsofoperationalamplifierandtobecomefamiliarizewith8085microprocessor

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	GainknowledgeandunderstandingofIC'SandMicroprocessor 8085	K2
CO2	Applythetheoreticalknowledgeandskilltodesigncircuit,make measurements,analyze andinterprettheexperimentaldata.	K3
CO3	Enhancethelogicalthinkingandabilitybywritingsimpleprogrammesusing8085microprocessorandemploythetechnical expertiseforinterfacingdevices	K4
CO4	Incorporateallthenecessarytools andskills todevisepractical circuitsthatperformdesiredoperations	K5
CO5	AbilitytoAugmentthepresentdayrequirementsinindustriesand research fields by developing their own firm or fetch anemploymentasaD esignengineer	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

ProgrammeCode:		M.Sc.PHY		**Programme Title:**	MasterofScience	
CourseCode:		22PPS415		**Title**	**Batch:**	2022 – 2024
				CoreXV: ComputerLabinC++	**Semester:**	IV
LectureHrs./Week	2	**TutorialHrs./Sem.**	-		**Credits:**	3

CourseObjective

Toacquirebasicknowledgein object orientedprogramming

CourseOutcomes

Onthesuccessfulcompletionofthecourse, studentswill beable to

CO Number	COStatement	Knowledge Level
CO1	Toremember thebasic C++language	K1/ K2
CO2	Toapplytheconceptsand benefits of OOPs	K3
CO3	ToanalyzethefunctionsofvariousC++operators	K4
CO4	ToevaluatetheC++languageto solveproblems inPhysics	K5
CO5	TocreatetheC++languageprograms	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

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ProgrammeCode:	M.Sc.PHY			Programme Title:	MasterofPhysics	
CourseCode:	22PPS416			Title	Batch:	2022 – 2024
				CoreXVI:Project	Semester:	III&IV
LectureHrs./Week or PracticalHrs./Week	3	TutorialHrs./Sem.	-		Credits:	8

VerifiedbyHOD	CheckedbyCDC	Approved by COE
Name:Dr.T.E.Manjulavalli	Name: Mr.K.Srinivasan	Name:Dr. R. ManickaChezian Signature:
Signature:	Signature:	

HoD

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