KONGUNADU ARTS AND SCIENCE COLLEGE

(AUTONOMOUS)

COIMBATORE -641029

Re-accredited by NAAC with 'A$^+$' Grade (4th Cycle) College of Excellence (UGC) Coimbatore – 641 029

DEPARTMENT OF PHYSICS

COURSE OUTCOME (CO)

B.Sc. PHYSICS

For the students admitted in the Academic Year 2021-2022

Sub. Code: 21UPH101

Programme Code: 03		B.Sc. Physics		
Title of the Paper		**Core Paper 1 - Properties of Matter and Sound**		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2021-2022	**I**	**6**	**90**	**5**

Course Objectives

To enable the learners to

1. Understand the basic concepts of gravitation.
2. Get exposure to the properties of liquids & solids.
3. Understand the properties of sound and applications.

Course Outcomes (CO)

K1 to K5	**CO1**	Understand the action of gravitational fields and potentials on different Objects
	CO2	Gain knowledge on elastic behavior of beams, rods and wires through the bending and torsional behaviors of the objects
	CO3	Compare the properties of liquids by surface tension
	CO4	Compare the properties of liquids by viscosity experiments
	CO5	Production and application of ultrasonics and acoustics in different types of Buildings

Sub Code: 21EVS101

Programme Code: 03		B.Sc. Physics		
Title of the paper		PART IV – ENVIRONMENTAL STUDIES		
Batch	**Semester**	**Hours / Week**	**Total Hours**	**Credits**
2021-2022	1	2	30	2

COURSE OBJECTIVES

- The course will provide students with an understanding and appreciation of the complex interactions of man, health and the environment. It will expose students to the multi-disciplinary nature of environmental health sciences
- To inculcate knowledge and create awareness about ecological and environmental concepts, issues and solutions to environmental problems.
- To shape students into good "Ecocitizens" thereby catering to global environmental needs.
- This course is designed to study about the types of pollutants including gases, chemicals petroleum, noise, light, global warming and radiation as well as pollutant flow and recycling and principles of environmental pollution such as air, water and soil
- The course will address environmental stress and pollution, their sources in natural and workplace environments, their modes of transport and transformation, their ecological and public health effects, and existing methods for environmental disease prevention and remediation.

COURSE OUTCOMES

K1 to K5	**CO 1**	Understand how interactions between organisms and their environments drive the dynamics of individuals, populations, communities and ecosystems
	CO2	Develop an in depth knowledge on the interdisciplinary relationship of cultural, ethical and social aspects of global environmental issues
	CO3	Acquiring values and attitudes towards complex environmental socio-economic challenges and providing participatory role in solving current environmental problems and preventing the future ones
	CO4	To gain inherent knowledge on basic concepts of biodiversity in an ecological context and about the current threats of biodiversity
	CO5	To appraise the major concepts and terminology in the field of environmental pollutants, its interconnections and direct damage to the wildlife, in addition to human communities and ecosystems

Sub. Code: 21UPH202

Programme Code: 03		B.Sc. Physics		
Title of the Paper		Core Paper 2 - Heat and Thermodynamics		
Batch 2021-2022	Semester 2	Hours/Week 6	Total Hours 90	Credits 5

Course Objectives

To enable the learners to understand

1. The concept of heat and temperature
2. Mechanism of petrol and diesel engine
3. Concept of real gas and specific heat
4. Quantum theory of radiation and three types of thermodynamical statistics.

Course Outcomes (CO)

K1 to K5	CO1	Understand the concept of Zero and First law of thermodynamics
	CO2	Gain knowledge on second law of thermodynamics and engines
	CO3	Understand gas laws and its behavior, Einstein's theory and Debye's theory of specific heat
	CO4	Understand radiative heat transfer and radiation laws
	CO5	Analyze the concepts of microstate, macrostate of a model system, classical and quantum statistics.

Sub. Code: 21UPH2CL

Programme Code: 03		B.Sc. Physics		
Title of the Paper		Core Practical I – Practical 1		
Batch 2021-2022	Semester 1 & 2	Hours/Week 3	Total Hours 90	Credits 2

Course Objectives

To enable the learners to:

1. Understand the physical phenomena and fundamentals of general physics.
2. Perform experiments in the field of general physics.
3. Interpret the practical result to corroborate the theory.

Course Outcomes (CO)

K3,K4,K5	CO1	Provide hands on experiences in conducting scientific investigations and laboratory experiments.
	CO2	Develop the ability to analyze basic experiments
	CO3	To analyze the relationship between theory and experimental results.
	CO4	To conduct experimental investigations on mechanical, electrical, heat and optical physics.
	CO5	Practice recording of experimental work and data graphing

Sub. Code: 21VED201

Programme Code: 03		B.Sc. Physics		
Title of the paper		**Part IV - Moral and Ethics**		
Batch 2021-2022	**Semester** 2	**Hours / Week** 2	**Total Hours** 30	**Credits** 2

Course Objectives

- To impart Value Education in every walk of life.
- To help the students to reach excellence and reap success.
- To impart the right attitude by practicing self introspection.
- To portray the life and messages of Great Leaders.
- To insist the need for universal brotherhood, patience and tolerance.
- To help the students to keep them fit.
- To educate the importance of Yoga and Meditation.

Course Outcomes (CO)

K1 to K5	**CO1**	will be able to recognize Moral values, Ethics, contribution of leaders, Yoga and its practice
	CO2	will be able to differentiate and relate the day to day applications of Yoga and Ethics in real life situations
	CO3	can emulate the principled life of great warriors and take it forward as a message to self and the society
	CO4	will be able to Analyse the Practical outcome of practicing Moral values in real life situation
	CO5	could Evaluate and Rank the outcome of the pragmatic approach to further develop the skills

Sub Code: 21UPH303

Programme Code: 03		B.Sc. Physics		
Title of the Paper		**Core Paper 3 – Mechanics**		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2021-2022	**3**	**4**	**60**	**5**

Course Objectives

To enable the learners to

1. Understand the principles of rigid body dynamics
2. Understand the fundamental ideas of projectile motions
3. Understand the statics, hydrostatics and hydrodynamics

Course Outcomes (CO)

K1 to K5	**CO1**	Understanding the behaviour of various bodies due to kinematic and dynamic forces acting on the body
	CO2	The study of projectiles enables the students to apply the knowledge of mathematics, fundamental sciences to obtain solution of complex mechanical Problems
	CO3	Study of statics promotes analysis and interpretation of numerical problems
	CO4	Gain knowledge on hydrostatics
	CO5	Understand hydrodynamics

Sub.Code:21UGA3S1

Programme Code: 03		B.Sc. Physics		
Title of the Paper		**SBS I – GENERAL AWARENESS**		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2021-2022	**3**	**2**	**30**	**3**

Course Objectives

1. To acquire knowledge in relation to various competitive examinations.
2. To encourage the students to newspaper reading and journals.
3. To familiarize the students with online examinations which are being adopted in competitive examinations.

Course Outcomes (CO)

K1 to K5	CO1	Knowledge about literature, Reasoning, Science and Technology and Youth Red Cross.
	CO2	Remembering important data on general knowledge
	CO3	Make use of the data for competitive examinations
	CO4	Analyse social phenomena
	CO5	Comprehend a glimpse and overview of civil service exams.

Sub Code: 21UPH404

Programme Code: 03		B.Sc. Physics		
Title of the Paper		Core Paper 4 - Electricity and Magnetism		
Batch 2021-2022	Semester 4	Hours/Week 4	Total Hours 60	Credits 5

Course Objectives

To enable the learners to
1. Acquire basic knowledge of electrostatics and thermoelectricity
2. Study about magnetic properties of materials
3. Learn motion of charges and alternating current and its circuits

Course Outcomes (CO)

K1 to K5	**CO1**	Acquire knowledge about electrostatics
	CO2	Understand the magnetic properties of materials and magnetic effect of electric current
	CO3	Gain knowledge on thermo electricity
	CO4	Apply knowledge on fabrication of different types of capacitors, transformer, choke coil and thermoelectric power generators.
	CO5	Analyze the trouble shooting of ac circuits (LCR series and LCR parallel mode) and also analyze the thermoelectric diagrams

Sub. Code: 21UPH4CM

Programme Code: 03		B.Sc. Physics		
Title of the Paper		Core Practical II – Practical 2		
Batch 2021-2022	Semester 3 & 4	Hours/Week 3	Total Hours 90	Credits 2

Course Objectives

To enable the learners to:
1. Understand the physical phenomena and fundamentals of general physics
2. Perform experiments in the field of general physics.
3. Interpret the practical result to corroborate the theory.

Course Outcomes (CO)

K3,K4,K5	**CO1**	Provide hands on experiences in conducting scientific investigations and laboratory experiments.
	CO2	Develop the ability to analyze basic experiments
	CO3	Analyze the relationship between theory and experimental results.
	CO4	To conduct experimental investigations on mechanical, electrical, heat and optical physics.
	CO5	Practice recording of experimental work and data graphing

Sub Code: 21UPH4S2

Programme Code: 03		B.Sc. Physics		
Title of the Paper		**Skill Based Subject 2 - Medical Instrumentation**		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2021-2022	**4**	**2**	**30**	**3**

Course Objectives

To enable the learners to

1. Understand about biomedical recorders and machines
2. Know the concepts of imaging techniques, cardiac and respiratory measurements
3. Know about radiation and electrical safety

Course Outcomes (CO)

K1 to K5	**CO1**	Gain knowledge about biomedical recorders
	CO2	Gain knowledge about machines
	CO3	Understand the concepts of imaging techniques
	CO4	Understand the concepts of cardiac and respiratory measurements
	CO5	Know about radiation and electrical safety

Sub. Code: 21UPH505

Programme code: 03		B.Sc. Physics		
Title of the Paper		**Core Paper 5 - Mathematical Physics**		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2021-2022	**5**	**4**	**60**	**4**

Course Objectives

To enable the learners to

1. Apply Fourier series and vector analysis to physical problems
2. Know about differential operators in various coordinate systems
3. Apply Lagrangian formulation to physical bodies.

Course Outcomes (CO)

K1 to K5	**CO1**	To understand physical examples of Fourier series
	CO2	To understand coordinates of operators in vectors
	CO3	To apply vectors for physical examples
	CO4	To solve problems using classical mechanics
	CO5	To solve problems using Lagrange's equations

Sub Code: 21UPH506

Programme code: 03		B.Sc. Physics		
Title of the Paper		Core Paper 6 - Optics		
Batch 2021-2022	Semester 5	Hours/Week 4	Total Hours 60	Credits 4

Course Objectives

To enable the learners to

1. Acquire knowledge in ray optics
2. Understand mechanism of energy transfer in the form of waves
3. Understand the basic principles of optical instruments

Course Outcomes (CO)

K1 to K5	**CO1**	Learn to use geometric approximation, the ray equations, understand the aberrations with an emphasis on image forming systems and how they can be reduced
	CO2	Understand wave optics and interference
	CO3	Be acquainted with Fresnel and Fraunhofer diffraction
	CO4	Gain knowledge on polarization
	CO5	Understand principle, construction and working of optical instruments

Sub. Code: 21UPH507

Programme code: 03		B.Sc. Physics		
Title of the Paper		Core Paper 7 - Principles of Electronic Devices and Circuits		
Batch 2021-2022	Semester 5	Hours/Week 4	Total Hours 60	Credits 4

Course Objectives

To enable the learners to

1. Understand the principles of semiconductor devices and their applications.
2. Know the principle and working of oscillators.
3. Know the working of FET, MOSFET and UJT

Course Outcomes (CO)

K1 to K5	**CO1**	Understand the fundamentals of semiconductor devices
	CO2	Understand transistor biasing and stabilization
	CO3	Learn about the functioning of FET, MOSFET,UJT and SCR
	CO4	Understand the basic principles of amplifiers and Operational amplifiers
	CO5	Acquire knowledge on oscillators

Sub Code: 21UPH508

Programme code: 03		B.Sc. Physics		
Title of the Paper		**Core Paper 8 - Quantum Mechanics and Relativity**		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2021-2022	**5**	**4**	**60**	**5**

Course Objectives

To enable the learners to

1. Know about DeBroglie concept and uncertainty relation
2. Know about the applications of Schrodinger's equation
3. Know about the constancy of light as well as mass energy relation

Course Outcomes (CO)

K1 to K5	**CO1**	Understand the wave aspects of matter
	CO2	Know the relation between group velocity and phase velocity of waves
	CO3	Understand uncertainty principle and its applications
	CO4	Understand Schrodinger's equation, wave function, , elementary concepts in statistics and to solve Schrodinger's equation for simple systems in one to three dimensions
	CO5	Understand the theory of relativity

Sub Code: 21UPH609

Programme code: 03		B.Sc. Physics		
Title of the Paper		**Core Paper 9 - Atomic and Solid State Physics**		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2021-2022	**6**	**5**	**75**	**4**

Course Objectives

To enable the learners to

1. Know about x - rays, Photoelectric effect and their applications
2. Know about different coupling schemes and the effect of magnetic and electric fields on the spectrum of an atom and molecule
3. Understand the different crystal structure and their bonds

Course Outcomes (CO)

K1 to K5	**CO1**	Acquire knowledge about atomic and molecular spectroscopy.
	CO2	Understand bonding in solids
	CO3	Understand crystal structure
	CO4	Gain knowledge about x-rays and photoelectric effect
	CO5	Understand the concept of electron theory of solids and behavior of Superconductors

Sub Code: 21UPH610

Programme code: 03		B.Sc. Physics		
Title of the Paper		Core Paper 10 - Fundamentals of Digital Electronics		
Batch 2021-2022	Semester 6	Hours/Week 4	Total Hours 60	Credits 4

Course Objectives

To enable the learners to acquire knowledge about

1. Four different number systems & binary codes
2. Logic gates, Boolean algebra and Karnaugh map
3. Flip- flops, counters, arithmetic circuits, data processing circuits, shift registers, semiconductor memories, A/D and D/A converters

Course Outcomes (CO)

K1 to K5	CO1	Acquire knowledge on number systems, binary arithmetic operations and binary codes
	CO2	Have an understanding of logic gates, Demorgan's theorems , Karnaugh maps and simplification of Boolean expressions
	CO3	Apply the knowledge of logic gates to design flip-flops and counters
	CO4	Understand arithmetic and data processing circuits
	CO5	Be familiar with semiconductor memories, A/D and D/A converters

Sub Code: 21UPH611

Programme code: 03		B.Sc. Physics		
Title of the Paper		Core Paper - 11: Nuclear Physics		
Batch 2021-2022	Semester 6	Hours/Week 5	Total Hours 75	Credits 5

Course Objectives

To enable the learner to know about

1. General properties of atomic nuclei, particle accelerators and radioactivity
2. Artificial transmutation of elements and nuclear transmutation
3. Nuclear fission, fusion and elementary particles

Course Outcomes (CO)

K1 to K5	CO1	Know about basic nuclear properties and particle accelerators.
	CO2	Gain knowledge on radioactivity
	CO3	Understand artificial and nuclear transmutations
	CO4	Understand nuclear fission, fusion and detection of nuclear radiations.
	CO5	Acquire knowledge on elementary particles

Sub Code: 21UPH6CN

Programme code: 03		B.Sc. Physics		
Title of the Paper		Core Practical III – Practical 3 - General Experiments		
Batch 2021-2022	Semester 5 & 6	Hours/Week 3	Total Hours 90	Credits 2

Course Objectives

To enable the learners to:

1. Have a good foundation in the fundamentals and applications of general Physics
2. Acquire the skill of finding and developing practical scientific facts
3. Employ the practical result to support the theory

Course Outcomes (CO)

K3,K4,K5	**CO1**	Develop the ability to analyse basic experiments.
	CO2	Take measurements to compare experimental results in the laboratory with the theoretical analysis.
	CO3	Conduct experimental investigations on mechanical, heat and optical phenomena.
	CO4	Conduct experimental investigations on electrical and magnetic phenomena.
	CO5	Practice record keeping of experimental work and data graphing

Sub Code: 21UPH6CO

Programme code: 03		B.Sc. Physics		
Title of the Paper		Core Practical IV – Electronics		
Batch 2021-2022	Semester 5 & 6	Hours/Week 3	Total Hours 90	Credits 2

Course Objectives

To enable the learners to

1. To design and construct electronic circuits
2. To develop experimental skills and understand relation between experimental data and theoretical analysis.
3. Have a foundation of constructing electronic devices

Course Outcomes (CO)

K3,K4,K5	**CO1**	Acquire basic knowledge in solid state electronics.
	CO2	Analyse and design analog electronic circuits using discrete components.
	CO3	Acquire knowledge in basic electronics by constructing electronic circuits and devices.
	CO4	Take measurements to compare experimental results with the theoretical data
	CO5	Practice record keeping of experimental work and data graphing

Sub Code: 21UPH6CP

Programme code: 03		B.Sc. Physics		
Title of the Paper		**Core Practical V - Digital Electronics &Microprocessor**		
Batch **2021-2022**	**Semester** **5 & 6**	**Hours/Week** **2**	**Total Hours** **60**	**Credits** **2**

Course objectives

To enable the learners to:

1. Have foundations in the fundamentals of digital electronics.
2. Acquire the skill of writing and executing assembly language programming using 8085 microprocessor
3. Visualize the applications of digital electronics and microprocessor in arithmetic operations

Course Outcomes (CO)

K3,K4,K5	**CO1**	Construct basic logic gates.
	CO2	Gain expertise to construct digital electronic circuits.
	CO3	Get familiarized to develop microprocessor based programming.
	CO4	Accomplish microprocessor based tasks.
	CO5	Practice record keeping of experimental work and data graphing

Sub Code: 21UPH6S3

Programme code: 03		B.Sc. Physics		
Title of the Paper		**Skill Based Subject 3 - Introduction to Microprocessor**		
Batch **2021-2022**	**Semester** **VI**	**Hours/Week** **2**	**Total Hours** **30**	**Credits** **3**

Course Objectives

To study about the

1. History, origin and development of microprocessor
2. Architecture, instruction set and programming of 8085 microprocessors
3. Interfacing and applications

Course Outcomes (CO)

K1 to K5	**CO1**	Know about history, origin and development of microprocessor
	CO2	Understand architecture
	CO3	Understand instruction sets
	CO4	Knowledge about programming and interfacing
	CO5	Understand the applications of microprocessor

Programme Code: 03		B.Sc. Physics		
Title of the Paper		Major Elective Paper : Laser Physics and Fiber Optics		
Batch 2021-2022	Semester 5 / 6	Hours/Week 4	Total Hours 60	Credits 5

Course Objectives

To enable the learners to

1. Acquire knowledge about principle, types and applications of lasers.
2. Understand about fabrication of optical fibers, fiber optic sensors and their applications.
3. Understand about optical fiber communication.

Course outcomes (CO)

K1 to K5	**CO1**	Understand the fundamentals of lasers
	CO2	Explain the concept of Q-switching and illustrate the working of various advanced lasers and its attenuation.
	CO3	Illustrate the application of lasers in various fields.
	CO4	Understand optical fibers and its attenuations
	CO5	Know about fabrication of optical fibers and fiber optic communication.

Programme code: 03		B.Sc. Physics		
Title of the Paper		Major Elective Paper - Principles of Communication Systems		
Batch 2021-2022	Semester 5 / 6	Hours/Week 4	Total Hours 60	Credits 5

Course Objectives

To enable the learners to

1. To understand the basic idea of modulation and demodulation
2. To gain knowledge on transmission lines and antennas
3. To know about radio, cellular, fiber optic, television and satellite communications

Course Outcomes (CO)

K1 to K5	CO1	Get knowledge about modulation and demodulation
	CO2	Understand the working principles of transmission lines and antennas
	CO3	Acquire knowledge on radio and cellular communications
	CO4	Gain knowledge on fiber optic communications
	CO5	Understand television and satellite Communications

Programme code: 03		B.Sc. Physics		
Title of the Paper		Major Elective Paper - Introduction to Biophysics		
Batch 2021-2022	Semester 5 / 6	Hours/Week 4	Total Hours 60	Credits 5

Course Objectives

To enable the learners to

1. To understand the concept of Physics principles and apply it to biological phenomenon
2. To know about Biophysics, fluid run and Gas transport
3. To know about audition of human ear and Physics of Vision

Course Outcomes (CO)

K1 to K5	CO1	Apply principles of Physics toward evaluation and analyses of biological phenomenon.
	CO2	Understand the basic concepts of biophysics and fluid run.
	CO3	Know about gas transport concepts.
	CO4	Acquire knowledge on Physics of audition.
	CO5	Acquire knowledge on Physics of vision.

Programme code: 03		B.Sc. Physics		
Title of the Paper		Major Elective Paper - Materials Science		
Batch 2021-2022	Semester 5 / 6	Hours/Week 4	Total Hours 60	Credits 5

Course Objectives

To enable the learners

1. To understand the electron theory of solids
2. To know about electric and dielectric properties of materials.
3. To know about magnetic and superconducting properties of materials.

Course Outcomes (CO)

K1 to K5	**CO1**	Understand the electron theory of solids.
	CO2	Know about electric properties of materials.
	CO3	Know about dielectric properties of materials.
	CO4	Understand magnetic properties of materials.
	CO5	Acquire knowledge about superconducting properties of materials.

Programme code: 03		B.Sc. Physics		
Title of the Paper		Major Elective Paper - Object Oriented Programming in C++		
Batch 2021-2022	Semester V / VI	Hours/Week 4	Total Hours 60	Credits 5

Course Objective

To enable the leraners

1. Know about the basics in C++ language
2. Develop programming skills in C++ language
3. Understand about various functions and operators.

Course Outcome (CO)

K1 to K5	**CO1**	Acquire basic knowledge about various data types, variables, operators and solving programs for real data.
	CO2	understand about function prototyping and function overloading
	CO3	Acquire relevant information about various classes, objects and programming with various functions and arguments.
	CO4	Gain knowledge on Constructors, Destructors
	CO5	Gain knowledge on Polymorphism and inheritance

Programme code: 03		B.Sc. Physics		
Title of the Paper		Major Elective Paper – Soil Physics		
Batch 2021-2022	Semester 5 / 6	Hours/Week 4	Total Hours 60	Credits 5

Course Objectives

To enable the learners

1. To know about composition of the soil
2. To understand the basic idea of soil and soil water behavior
3. To gain knowledge on soil temperature and soil environment

Course Outcomes (CO)

K1 to K5	**CO1**	Get knowledge about soil composition
	CO2	Understand the soil behavior
	CO3	Acquire knowledge on soil environment
	CO4	Gain knowledge on soil temperature
	CO5	Understand soil water behavior

Sub. Code : 21UHR3N1

Programme Code : 03		B.Sc, Physics		
Title of the Paper		**PART IV - NON MAJOR ELECTIVE - I HUMAN RIGHTS**		
Batch 2021-2022	**Semester** 3	**Hours / Week** 2	**Total Hours** 30	**Credits** 2

Course Objectives

1. To prepare for responsible citizenship with awareness of the relationship between Human Rights, democracy and development.
2. To impart education on national and international regime on Human Rights.
3. To sensitive students to human suffering and promotion of human life with dignity.
4. To develop skills on human rights advocacy
5. To appreciate the relationship between rights and duties
6. To foster respect for tolerance and compassion for all living creature.

Course Outcome (CO)

K1 to K5	**CO1**	To understand hidden truth of Human Rights by studying various theories.
	CO2	To acquire overall knowledge regarding Human Rights given by United Nation Commission. (UNO)
	CO3	To gain knowledge about various organs responsible for Human Rights such as National Human Rights Commission and state Human Right commission (UNHCR)
	CO4	To get habits of how to treat aged person, others and positive social Responsibilities
	CO5	To treat and confirm, child, refugees and minorities with positive social justice.

Sub. Code : 21UWR4N2

Programme Code: 03		**B.Sc, Physics**		
Title of the Paper		**Part IV -Non- Major Elective – II Women's Rights**		
Batch **2021-2022**	Semester **4**	Hours / Week **2**	Total Hours **30**	Credits **2**

Course Objective

1. To know about the laws enacted to protect Women against violence.
2. To impart awareness about the hurdles faced by Women.
3. To develop a knowledge about the status of all forms of Women to access to justice.
4. To create awareness about Women's rights.
5. To know about laws and norms pertaining to protection of Women.
6. To understand the articles which enables the Women's rights.
7. To understand the Special Women Welfare laws.
8. To realize how the violence against Women puts an undue burden on healthcare services.

Course Outcome (CO)

K1 to K5	**CO1**	Appraise the importance of Women's Studies and incorporate Women's Studies with other fields.
	CO2	Analyze the realities of Women Empowerment, Portrayal of Women in Media, Development and Communication.
	CO3	Interpret the laws pertaining to violence against Women and legal consequences.
	CO4	Contribute to the study of the important elements in the Indian Constitution, Indian Laws for Protection of Women.
	CO5	Spell out and implement Government Developmental schemes for women and create awareness on modernization and impact of technology on Women.

Programme Code : 03		B.Sc, Physics		
Title of the Paper		Part IV - Non- Major Elective III - Consumer Affairs		
Batch **2021-2022**	**Semester** **5**	**Hours/Week** 2	**Total Hours** 30	**Credits** 2

Course Objectives

1. To familiarize the students with their rights and responsibilities as a consumer.
2. To understand the procedure of redress of consumer complaints.
3. To know more about decisions on Leading Cases by Consumer Protection Act.
4. To get more knowledge about Organizational set-up under the Consumer Protection Act
5. To impart awareness about the Role of Industry Regulators in Consumer Protection
6. To understand Contemporary Issues in Consumer Affairs

Course Outcomes (CO)

K1 to K5	**CO1**	Able to know the rights and responsibility of consumers.
	CO2	Understand the importance and benefits of Consumer Protection Act.
	CO3	Applying the role of agencies in establishing product and service standards.
	CO4	Analyse to handle the business firms' interface with consumers.
	CO5	Assess Quality and Standardization of consumer affairs

Sub. Code: 21UPH5X1

Programme Code: 03		B.Sc. Physics		
Title of the Paper		EDC - Physics in Everyday life		
Batch **2021-2022**	**Semester** **5**	**Hours/Week** **2**	**Total Hours** **30**	**Credits** **3**

Course Objectives

To study about the

1. Physics of Universe and solar systems
2. Principles, advancements and applications of Physics in various fields.
3. Physics principles involved in common household appliances

Course outcomes (CO)

K1 to K5	**CO1**	Understand origin of universe and study about planets.
	CO2	Study Physics in Human anatomy.
	CO3	Study about various Physics principles behind sports.
	CO4	Application of Physics in Technology.
	CO5	Realize Physics in appliances

Programme code: 03		B.Sc. Physics		
Title of the course		JOC - Electrical Appliances: Maintenance and Servicing		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Extra credits**
2021-2022	**3 / 5**	**2**	**30**	**2**

Course Objectives

To study about

1. Fundamentals of electricity, electrical connections and wiring
2. Heating and motorized appliances
3. Refrigerator, air cooler and air conditioner appliances

Course Outcomes (CO)

K1 to K5	**CO1**	Understand the fundamentals of electricity
	CO2	Understand the fundamentals of electrical connections and wiring
	CO3	Understand heating appliances
	CO4	Understand motorized appliances
	CO5	Understand refrigerator, air cooler and air conditioner appliances

Programme code: 03		B.Sc. Physics		
Title of the course		ALC - Measurement techniques and Data analysis		
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Extra credits**
2021-2022	**-**	**-**	**-**	**2**

Course Objectives

To study about

1. Basic concept of measurement & transducers
2. Measurement of error and standards of measurements
3. Electronic and vibration measuring instruments

Course Outcomes (CO)

K1 to K5	**CO1**	Understand the basic concept of measurement & transducers
	CO2	Understand measurement of error
	CO3	Understand standards of measurements
	CO4	Know about electronic measuring instruments
	CO5	Know about vibration measuring instruments

Programme Code: 03		B.Sc. Physics		
Title of the Paper		Basic Electronic Instrumentation		
Batch 2021-2022	Semester 2	Hours/Week 2	Total Hours 30	Credits 2

Course Objectives

To enable the learners

1. Understand the basic concepts of measurement and error analysis.
2. Get exposure to the knowledge on transducers and basic meters.
3. Understand the working of regulated power supply.

Course Outcomes (CO)

K1 to K5	CO1	Understand the concept of analog and digital measurement techniques
	CO2	Gain knowledge on accuracy of measurements and their error analysis
	CO3	Acquire knowledge on different type of transducers
	CO4	Acquire knowledge on different type of meters
	CO5	Understand the working of regulated power supply

Sub. Code : 21CEI202

Programme Code: 03		B.Sc. Physics		
Title of the Paper		Modern Electronic Instrumentation		
Batch 2021-2022	Semester 2	Hours/Week 2	Total Hours 30	Credits 2

Course Objectives

To enable the learners

1. Understand different types of display techniques.
2. Acquire knowledge on waveform generators and household wiring
3. Understand the function of Ardrino platform and Internet of Things

Course Outcomes (CO)

K1 to K5	CO1	Understand the different types of display techniques
	CO2	Gain knowledge on wave form generators
	CO3	Get exposure to modern house hold wiring techniques
	CO4	Acquire knowledge on Arduino software interface
	CO5	Understand the concept of Internet of Things

Sub. Code : 21CAP301

Programme Code: 03		B.Sc. Physics		
Title of the Paper		Astronomy and Astrophysics		
Batch 2021-2022	Semester 3	Hours/Week 2	Total Hours 30	Credits 2

Course Objectives

To enable the learners

1. To know about the universe and astronomical objects
2. To know about the astronomical instruments, Indian astronomy and astronomers
3. To know about the applications of astronomy

Course Outcomes (CO)

K1 to K5	CO1	Understand the origin of universe.
	CO2	Gain knowledge on astronomical objects
	CO3	Acquire knowledge on astronomical instruments
	CO4	Know about Indian Astronomy and Astronomers
	CO5	Realize various applications of astronomy

Programme Code: 03		B.Sc. Physics		
Title of the Paper		Stellar Evolution and Astronomical imaging		
Batch 2021-2022	Semester 3	Hours/Week 2	Total Hours 30	Credits 2

Course Objectives

1. To know about the calendar and constellations
2. To know about the stellar distances and stellar evolution
3. To know about the luminosity of stars and advanced astronomical imaging techniques

Course Outcomes (CO)

K1 to K5	CO1	Understand sky and calendar
	CO2	Get exposure to measure the distances in space
	CO3	Gain knowledge about the evolution of stars, their birth and decay
	CO4	Will understand intensity of stars and their measurements
	CO5	Get knowledge on advanced imaging methods and analysis

Programme Code: 03		B.Sc. Physics		
Title of the Paper		Non-Conventional Energy sources and storage system		
Batch 2021-2022	Semester 5	Hours/Week 2	Total Hours 30	Credits 2

Course Objectives

To enable the learners

1. Understand various forms of non-conventional energy sources and ways to harness energyfrom these energy sources.
2. Have a broad understanding of scientific principles that underpin the operation of suchsystems.
3. Acquire knowledge on different types of energy storage systems.

Course Outcomes (CO)

K1 to K5	CO1	Know about the need of non-conventional energy
	CO2	Gain knowledge on solar and wind energy
	CO3	Acquire knowledge on Biomass, Wave, Tidal and Geothermal energy
	CO4	Understand MHD, Thermal and Hydrogen energy
	CO5	Acquire knowledge on different energy storage systems

Sub Code : 21CNE502

Programme Code: 03		B.Sc Physics		
Title of the Paper		Energy Management and Auditing		
Batch 2021-2022	Semester 5	Hours/Week 2	Total Hours 30	Credits 2

Course Objectives

To enable the learners

1. Understand the concepts and features of energy conservation.
2. Gain knowledge on energy management techniques.
3. Acquire knowledge on energy audit.

Course Outcomes (CO)

K1 to K5	CO1	Understand the concept of energy conservation.
	CO2	Know about energy management techniques.
	CO3	Gain knowledge on methodologies of energy audit.
	CO4	Acquire knowledge on material and energy balance.
	CO5	Understand the duties and responsibilities of energy manager and energy auditors.

Sub. Code: 21UPH4A2

ALLIED PHYSICS PAPER FOR B.Sc. MATHEMATICS / CHEMISTRY

Programme code: 03		**For B.Sc. Mathematics and B.Sc Chemistry**		
Title of the Paper		**Allied Subject I – Physics II** (MODERN PHYSICS, ELECTRONICS AND DIGITAL ELECTRONICS)		
Batch **2021-2022**	**Semester** **4**	**Hours/Week** **4**	**Total Hours** **60**	**Credits** **4**

Course Objectives

To enable the learners

1. To know about atomic physics and concepts of relativity
2. To understand nuclear and quantum Physics
3. To know the basics of lasers, electronics and communication Physics

Course Outcomes (CO)

K1 to K5	**CO1**	Understand atomic Physics and concepts of relativity
	CO2	Know about nuclear Physics
	CO3	Know about quantum Physics
	CO4	Acquire knowledge on laser Physics
	CO5	Understand electronics and communication Physics

Sub. Code: 21UPH4AL

ALLIED PHYSICS PRACTICALS FOR B.Sc. MATHEMATICS / CHEMISTRY

Programme code: 03		**For B.Sc Mathematics and B.Sc Chemistry**		
Title of the Paper		**Allied Physics Practical**		
Batch 2021-2022	**Semester** **3 & 4**	**Hours/Week** **3**	**Total Hours** **90**	**Credits** **2**

Course Objectives

To enable the learners to:

1. Understand Physical phenomena and fundamentals of general Physics.
2. Perform experiments in Physics and understanding the results.
3. Interpret the experimental results to support the theory

Course Outcomes (CO)

K3,K4,K5	**CO1**	Provide hands on experiences in conducting laboratory experiments.
	CO2	Analyse relationship between theory and experimental results.
	CO3	Conduct experimental investigations on mechanical and heat and optical Physics.
	CO4	Conduct experimental investigations on optics, electricity and electronics
	CO5	Practice record keeping of experimental work