PHYSICS
COURSE OUTCOME

MPHYCC-1

1. Understand the distinction between Newtonian mechanics and Analytical mechanics.
2. Solve mechanics problems using Lagrangian formalism, an alternative approach to Newtonian mechanics.
3. Explore the connection between classical mechanics and quantum mechanics through Hamiltonian formalism.
4. Gain a foundational understanding of the key concepts in the special and general theories of relativity.

MPHYCC-2

1. Master the fundamental concepts of complex mathematical analysis.
2. Solve differential equations commonly encountered in the physical sciences.
3. Apply group theory and integral transforms to address mathematical problems relevant to physics.
4. Understand the use of special functions in solving various physics problems.
5. Grasp the properties of covariance and the principle of equivalence.

MPHYCC-3

1. Develop a solid working knowledge of the foundations, techniques, and key results of quantum mechanics.
2. Comprehend fundamental quantum mechanical applications at the research level.
3. Acquire the ability to effectively explain and teach quantum physics to others.

MPHYCC-4

1. Students should gain knowledge of various experimental techniques.
2. Students should understand the fundamental physics principles underlying experiments.
3. Students should be able to apply physics concepts, interpret data, and obtain meaningful results.

MPHYCC-5

1. Learn to interpret and analyze data visually, both during and after computations.
2. Develop the ability to apply physical principles to solve real-world problems.
3. Acquire a working knowledge of basic research methodologies, including data analysis and interpretation.
4. Understand various simulation techniques that students can use in the future to analyze data.

MPHYCC-6

1. Study time-varying fields and Maxwell's equations.
2. Understand various concepts of electromagnetic waves.
3. Explore radiation from localized time-varying sources and charged particle dynamics.

MPHYCC-7

1. Learn fundamental design concepts of various logic gates and minimization techniques.
2. Design different types of digital circuits and provide computational details for these circuits.
3. Understand the characteristics of devices like PNP and NPN junction diodes, and analyze truth tables of different logic gates.
4. Study basic electronic components and learn to measure values using a multi meter, including characteristic analysis.
5. Gain knowledge on how to construct and design electronic circuits.

MPHYCC-8

1. Acquire basic knowledge of thermodynamic systems.
2. Understand the fundamental concepts of statistical distributions.
3. Gain knowledge about phase transitions and thermodynamic potentials.
4. Learn the applications of statistical laws.

MPHYCC-9

1. Understand the fundamentals of solving problems using computational methods.
2. Learn to interpret and visually analyze data during and after computation.
3. Develop the ability to apply physical principles to real-world problems.
4.Acquire a working knowledge of basic research methodologies, data analysis, and interpretation.
5. Recognize the impact of physics in a global and societal context.

MPHYCC-10

1. Study atomic spectroscopy of atoms with one and two valence electrons.
2. Understand how atoms behave under applied electric and magnetic fields.
3. Explore rotational, vibrational, electronic, and Raman spectra of molecules.
4. Learn about electron spin resonance (ESR) and nuclear magnetic resonance (NMR) spectroscopy.
5. Understand the principles, workings, and applications of lasers.

MPHYCC-11

1. Study the structures of solids and their determination using X-ray diffraction (XRD).
2. Understand the behavior of electrons in solids, including the concept of energy bands and their effects on material properties.
3. Explore the electrical, thermal, magnetic, and dielectric properties of solids.

MPHYCC-12

1. Learn the fundamental design concepts of various logic gates and minimization techniques.
2. Design different types of digital circuits and provide detailed computations for these circuits.

3. Understand the characteristics of devices such as PNP junction diodes and analyze the truth tables of different logic gates.
4. Study basic electronic components, measure their values with a multi meter, and explore their characteristics.
5. Learn the workings of flip-flops, registers, and counters.

MPHYCC-13

1. Acquire fundamental knowledge of nuclear and particle physics.
2. Develop an understanding of nuclear reactions and neutron physics.
3. Understand nuclear fission and fusion reactions.
4. Gain knowledge about nuclear forces and elementary particles.

MPHYCC-14

1. The student will gain knowledge of various experimental techniques used in electronics.
2. The student will be able to independently construct electronic circuits.
3. The student will apply electronic concepts to interpret data and obtain results.

MPHYEC-1A

1. Understand the significance of relativistic quantum mechanics in comparison to non-relativistic quantum mechanics.
2. Explore various tools and methods for understanding field quantization and related concepts.
3. Gain exposure to quantum field theory and the study of universal interactions.

MPHYEC-1I

1. Learn theoretical methods to study the motion of charged particles.
2. Understand the process of generating plasma in the laboratory.
3. Explore how plasma production mechanisms contribute to the development of fusion reactors.

MPHYEC-1K

1. Understand the importance of solar energy and other renewable energy sources.
2. Learn about the essential components, applications, and limitations of renewable energy systems.
3. Design renewable energy systems based on specific requirements.
4. Contribute to reducing dependence on conventional energy sources.

MPHYEC -1L

1. Understand the importance of the fundamentals of environmental processes.
2. Gain opportunities to work at meteorological stations and potentially establish stations in remote areas for future improvements.
3. Develop a deeper understanding of global and regional climate change.