CHOICE BASED-CREDIT & SEMESTERSYSTEM (CBCSS)

(2014 ADMISSION ONWARDS)

CORE COURSES (THEORY)

Semester -1

Title of Paper: PY1141: BASIC MECHANICS & PROPERTIES OF MATTER

No. of credits: 2 **No. of hours per week:** 2

Course Outcome

At the end of the course, the student will be able to:

S No.	Course Outcome No.	Course Outcome	Taxonomic Level
1.	CO1	understand of concepts and principles related to mechanics and properties of matter and examine the basic principles of mechanics	Un, Re
2.	CO2	analyse various oscillating systems obeying simple harmonic motion	Un, Re
3.	CO3	understand the conservation of energy and associated theory	Re, Un, Ap
4.	CO4	have a complete idea about the basic laws and theorems of fluid dynamics	Re, Un, Ap

Semester -2

Title of Paper: PY1221 -CLASSICAL MECHANICS

No. of credits: 2 **No. of hours per week:** 2

Course Outcome

At the end of the course, the student will be able to:

S No.	Course Outcome No.	Course Outcome	Taxonomic Level
1.	CO1	Knowledge and understanding of the classical laws of motion.	Un, Re
2.	CO2	Competency in using the essential mathematical skills needed for describing mechanics and special relativity	Un, Re, Ap
3.	CO3	Problem solving skills- Lagrangian and Hamiltonian mechanics applied to basic systems.	Re, Un, Ap
4.	CO4	have an idea about the influence of classical mechanics and relativity on modern scientific development.	Re, Un, Cr
5.	CO5	Develop an interest in the role of mechanics and relativity in the everyday world.	Re, Un, Cr
6.	CO6	Demonstrate an understanding of the basic principles of special theory of relativity'	Re, Un

Semester -3

Title of Paper: PY1341 -THERMODYNAMICS AND STAT ISTICAL PHYSICS

No. of credits: 3 **No. of hours per week:** 3

Course Outcome

At the end of the course, the student will be able to:

S No.	Course Outcome No.	Course Outcome	Taxonomic Level
1.	CO1	Use thermodynamic terminology correctly and explain fundamental thermodynamic properties and various laws of thermodynamics.	Un, Re, Ap
2.	CO2	develop the problem solving skill to s using the properties and relationships of thermodynamic systems and to analyse basic thermodynamic cycles.	Un, Re, Cr
3.	CO3	develop an idea about various phenomena of heat transference.	Re, Un,Cr
4.	CO4	explain statistical physics as logical consequences of the postulates of statistical mechanics	Un, Re, An
5.	CO5	use the methods of statistical mechanics to develop the statistics for Maxwell Boltzmann, Bose-Einstein, Fermi-Dirac distributions and understand statistics of particles	Un, Re, An, Ap, Cr

Semester -4

Title of Paper: PY 1441 ELECTRODYNAMICS

No. of credits: 3 **No. of hours per week:** 3

Course Outcome

At the end of the course, the student will be able to:

S No.	Course Outcome No.	Course Outcome	Taxonomic Level
1.	CO1	learn the concepts and properties of electric and magnetic fields in vacuum and matter	Un, Re
2.	CO2	Acquire a thorough knowledge on the vast theory of electrostatics and magnetostatics	Un, Re
3.	CO3	explain classical electrodynamics based on Maxwell's equations	Re, Un, Ap
4.	CO4	concepts and properties of electromagnetic wave propagation and emission	Re, Un, Ap
5.	CO5	Apply Maxwell's equations to a variety of problems and solve problems involving the propagation and scattering of electromagnetic waves in a variety of media, calculation of fields, the motion of charged particles etc	Re, Ap
6.	CO6	Demonstrate an understanding of the characteristics of electromagnetic radiation.	Un, Ap
7.	CO7	To evaluate various circuits including L,C, R and to analyze their complete response	Un, An
8.	CO8	Apply various network theorems to determine the circuit response .	Un, Ap

Semester -5

Title of Paper: PY1541: METHODOLOGY IN PHYSICS & RELATIVISTIC MECHANICS

No. of credits: 4 **No. of hours per week:** 4

Course Outcome

At the end of the course, the student will be able to:

S No.	Course Outcome No.	Course Outcome	Taxonomic Level
1.	CO1	use the methods of statistical mechanics to develop the statistics for Maxwell Boltzmann, Bose-Einstein, Fermi-Dirac distributions and understand statistics of particles	Un, Re, Cr
2.	CO2	understand some basic concepts of research and its methodologies, identify appropriate research topics, select and define appropriate research problem and parameters, prepare a project proposal , organize and conduct research in a more appropriate manner ,write a research report and thesis	Re, Un, Ap, Cr
3.	CO3	Problem solving skills- Lagrangian and Hamiltonian mechanics applied to basic systems.	Re, Un, Ap, Cr
4.	CO4	have an idea about the influence of classical mechanics and relativity on modern scientific development.	Re, Un, Ap. Cr
5.	CO5	An interest in the role of mechanics and relativity in the everyday world.	Re, Un, An , Ev
6.	CO6	Demonstrate an understanding of the basic principles of special theory of relativity'	Re, Un, An, Cr

Title of Paper: PY1542- QUANTUM MECHANICS

No. of credits: 4 **No. of hours per week:** 4

Course Outcome

At the end of the course, the student will be able to:

S No.	Course Outcome No.	Course Outcome	Taxonomic Level
1.	CO1	Gain a knowledge on the emergence of quantum mechanics, wave properties of matter, general formalism on wave mechanics	Un, Re
2.	CO2	understand how a wave function is interpreted in terms of probability, and appreciate its physical significance	Un, Re
3.	CO3	understand how a wave function is interpreted in terms of probability, and appreciate its physical significance	Re, Un, Ap
4.	CO4	derive and apply Schrodinger equation to Hydrogen atom	Re, Un, Ap
5.	CO5	apply principles of quantum mechanics to calculate observables on known wave functions	Re, Un
6.	CO6	gain knowledge about fundamental quantum mechanical processes in nature	Un, Cr

Title of Paper: PY1543-ELECTRONICS

No. of credits: 4 **No. of hours per week:** 4

Course Outcome

At the end of the course, the student will be able to:

S No.	Course Outcome No.	Course Outcome	Taxonomic Level
1.	CO1	students possess advanced knowledge, skills and competence in the subject of analog electronics.	Un, Re, Ap
2.	CO2	Analyze simple electronic circuits based on diodes and transistors with special focus on designing amplifiers with discrete components	Un, Re, An
3.	CO3	Design and analyze bias circuits for BJTs and amplifiers for the basic categories (CB, CE and CC)	Re, Un, Ap, Cr
4.	CO4	Analyze oscillator circuits, feedback amplifiers, operation amplifiers etc	Re, Un, Ap, Cr

Title of Paper: PY1544-ATOMIC & MOLECULAR PHYSICS

No. of credits: 4 **No. of hours per week:** 4

Course Outcome

At the end of the course, the student will be able to:

S No.	Course Outcome No.	Course Outcome	Taxonomic Level
1.	CO1	Gain a thorough knowledge of vector atom model	Un, Re
2.	CO2	To explain the change in behaviour of atoms in external applied electric and magnetic field.	Un, Re
3.	CO3	Explain rotational, vibrational, electronic and Raman spectra of molecules.	Re, Un, Ap
4.	CO4	Describe electron spin and nuclear magnetic resonance spectroscopy and their applications.	Re, Un, Ap

Semester – 6

Title of Paper- PY 1641 SOLID STATE PHYSICS

No. of credits: 4 **No. of hours per week: 4**

Course Outcome

At the end of the course, the student will be able to:

S No.	Course Outcome No.	Course Outcome	Taxonomic Level
1.	CO1	have a basic knowledge of crystal systems and spatial symmetries	Un, Re, Cr
2.	CO2	provide how crystalline materials are studied using diffraction and know the principles of structure determination by diffraction.	Un, Re, An
3.	CO3	understand the concept of reciprocal space and be able to use it as a tool and to know the significance of Brillouin zones	Re, Un, An
4.	CO4	account for interatomic forces and bonds and understand the conduction in metals	Re, Un, Ap, Ap
5.	CO5	Understand the Magnetic, optical and electrical properties of materials	Re, Un
6.	CO5	Obtain an outline of superconductivity and its basic properties	Re, Un, An

Title of Paper- PY 1642 NUCLEAR AND PARTICLE PHYSICS

No. of credits: 4 **No. of hours per week: 4**

Course Outcome

At the end of the course, the student will be able to:

S No.	Course Outcome No.	Course Outcome	Taxonomic Level
1.	CO1	Gain a thorough understanding of the constituents of a nucleus, its basic properties, stability etc and about the various models used to explain the nucleus	Un, Re, Cr
2.	CO2	explain alpha, beta and gamma decay at a basic particle physics level	Un, Re, Ap
3.	CO3	apply the concepts of fission and fusion to power generation	Re, Un, Ap
4.	CO4	know the theory behind particle detectors	Re, Un, Ap
5.	CO5	gain knowledge about the basics of particle physics and the conservation laws obeyed by them	Re, Un, An

Title of Paper- PY1643- CLASSICAL AND MODERN OPTICS

No. of credits: 4 **No. of hours per week: 4**

Course Outcome

At the end of the course, the student will be able to:

S No.	Course Outcome No.	Course Outcome	Taxonomic Level
1.	CO1	Analyze the intensity variation of light due to Polarization, interference, diffraction and dispersion	Un, Re, An
2.	CO2	Understand a knowledge about optical fiber, its types and its application in communication	Un, Re, Ap
3.	CO3	Explain the working principle, recording, reconstruction and types in holography	Re, Un, Ap
4.	CO4	Explain working principle of lasers	Re, Un, Ap

Title of Paper- PY1644-DIGITAL ELECTRONICS AND COMPUTER SCIENCE

No. of credits: 4 **No. of hours per week: 3**

Course Outcome

At the end of the course, the student will be able to:

S No.	Course Outcome No.	Course Outcome	Taxonomic Level
1.	CO1	Gain a deep knowledge on number systems, types, conversion, coded number systems etc	Un, Re, Cr
2.	CO2	Design, construct and analyze basic logic circuits using logic gates	Un, Re, Cr
3.	CO3	Gain a deep knowledge about arithmetic circuits and sequential circuits	Re, Un, An
4.	CO4	Gain an adequate knowledge about the various functioning of computer components, the process of problem solving using computer, internal organization of computer, memory hierarchy.	Re, Un, Ap, An
5.	CO5	By learning C language, the students will be able to enhance their analyzing and problem solving skills and use the same for writing programs in C.	Re, Un, Ap
6.	CO6	understand theory and problems based on iterative methods, interpolation, regression and numerical integration and differentiation.	Un, Re, Ap, Ev, Cr

PY1661. ELECTIVE COURSES (54 HOURS-2CREDITS) FOR EACH COURSE

Title of Paper **PY1661.1 ELECTRONIC INSTRUMENTATION**

No. of credits: 2 **No. of hours per week: 3**

Course Outcome

At the end of the course, the student will be able to:

S No.	Course Outcome No.	Course Outcome	Taxonomic Level
1.	CO1	Gain idea about the concepts of measurement various electrical parameters with accuracy, precision, resolution.	Un, Re, Cr
2.	CO2	passive or active transducers for measurement of physical phenomenon	Un, Re, An
3.	CO3	use and functioning of signal generator, function generator, wave analysers, CRO and spectrum analyser.	Re, Un, Ap, An

CORE COURSES (PRACTICALS)

PY1441 – Mechanics, Properties of mat ter, Error measurements, Heat and Acoustics (S1, S2,S2, &S4)

No. of credits: 3 **No. of hours per week: 2**

Course Outcome

At the end of the course, the student will be able to:

S No.	Course Outcome No.	Course Outcome	Taxonomic Level
1.	CO1	Understanding on various experiments in mechanics	Un, An, Ap
2.	CO2	Understanding on various experiments in fluid dynamics.	Un, An, Ap

PY1645 – Optics, Electricity and magnetism (S5 & S6)

No. of credits:2 **No. of hours per week: 2**

Course Outcome

At the end of the course, the student will be able to:

S No.	Course Outcome No.	Course Outcome	Taxonomic Level
1.	CO1	Complete understanding on various electricity magnetism experiments	Un, An, Ap
2.	CO2	Hands on training and gaining knowledge on optics experiments	Un, An, Ap

PY1646 – Electronics and Computer science (S5 & S6)

No. of credits:2 **No. of hours per week: 2**

Course Outcome

At the end of the course, the student will be able to:

S No.	Course Outcome No.	Course Outcome	Taxonomic Level
1.	CO1	Complete understanding on various various Electronics experiments	Un, An, Ap
2.	CO2	Hands on training and gaining knowledge on Computer programming (C++)	Un, An, Ap

PY1645 – Project(S5 & S6)

No. of credits:4 **No. of hours per week: 2**

Course Outcome

At the end of the course, the student will be able to:

S No.	Course Outcome No.	Course Outcome	Taxonomic Level
1.	CO1	Understanding on Emerging developments in Physics	Un, An, Ap
2.	CO2	Inculcate research aptitude	Un, Ap