M.Sc. PHYSICS

SEMESTER-I

COURSE: -PHY101-CLASSICAL MECHANICS

COs	Course Outcomes (COs)	Level
CO1	Apply Lagrangian and Hamiltonian approach to over come limitations existing in the Newtonian mechanics.	L3
CO2	Description about central force problem.	L2
CO3	Interpretation of concepts of Rigid dynamics.	L3

COURSE: -PHY102–INTRODUCTORY QUANTUM MECHANICS

COs	Course Outcomes (COs)	Level
CO1	Understanding of Wave particle duality, wave function and its properties, wave equation, concept of wave packet and its applications.	L2
CO2	Understanding and apply the basic mathematical concepts needed for Quantum Mechanics.	L2
CO3	Analyze Wave equations of the particle in one and three dimensional various type of physical potentials.	L4
CO4	Apply mathematics to solve angular momentum operator and various commutative relation of angular momentum.	L3
CO5	Apply Various appropriate techniques for few physical problems where wave mechanical concepts could not solve.	L3

COURSE: - PHY 103–MATHEMATICAL METHODS OF PHYSICS

COs	Course Outcomes (COs)	Level
CO1	Knowledge of Complex Function Concepts and Analytic Nature of Complex Function Evaluation of integrals over Irregular Objects, Series Expansion of Complex Function.	**L2&L4**
CO2	Analyzing of Solving Complicated Functions by Using Special Functions Like Legender, Bessels ,Lagurre Polynomials.	**L4**
CO3	Conversion of Function From One Domain to Another Domain by using Fourier and Laplace Trasformation Techniques.	**L3**

COURSE: -PHY104–ELECTRONIC DEVICES AND CIRCUITS

COs	Course Outcomes (COs)	Level
CO1	Knowledge of Simple Electronic Circuits Containing LED, photo Diode, Varactor Diode .	**L2**
CO2	Able to understand the Micro wave Concepts and their unique features.	**L2**
CO3	Able to Design Electronic Circuits based on the Op-Amps for Various Mathematical and Scientific applications .	**L6 & L3**

COURSE: – PHY105 – MODREN PHYSICS LAB

COs	Course Outcomes (COs)	Level
CO1	Determining the Planck's constant and work function of a photo cell.	**L5**
CO2	Determining number of lines lines on grating and wavelength of the LASER beam.	**L5**
CO3	Determining wavelength of Zinc triplets.	**L5**
CO4	proving atom emites different radiation at different atomic energy levels.	**L5**
CO5	Determing band gap of semiconductors using two probe method.	**L5**

COURSE: -PHY106- ELECTRONICS LAB

COs	Course Outcomes (COs)	Level
CO1	Constructing Phase shift Oscillator circuit and determining the output frequency of oscillator.	L6
CO2	Constucting Field effect Transistor and study its frequency response.	L6
CO3	Constructing Astable multivibrator and determining its output time period and frequency.	L6
CO4	Constructing Negative feedback amplifier circuit and draw frequency response graph with and without feedback and calculate bandwidth and gain in each case.	L6
CO5	Observing the characterstics of UJT and calculate the intrinsic stand off ratio.	L6

SEMESTER - II

COURSE: -PHY201–STATISTICAL MECHANICS

COs	Course Outcomes (COs)	Level
CO1	To discuss Behaviour of the system under Various equilibrium conditions, Concepts of Various Ensembles.	L2
CO2	Comprehension of Partition function and applications of Partition functions for Different types of systems.	L2
CO3	Apply fundamental concepts of Quantum Statistics and their probability expressions to evaluation of various statistical parameters.	L3
CO4	Basic concepts of relativity and four vector concepts.	L2

COURSE: -PHY202-ELECTRODYNAMICS

COs	Course Outcomes (COs)	Level
CO1	Analyze the Static electric field, electric potential, magnetic field produced by various types of sources.	**L4**
CO2	Concepts of Maxwell equations of Electro magnetism, Electro magnetic wave equations, wave equation modification in various media.	**L2**
CO3	Analyze Fundamental concepts of various types of potential problems, Radiation concepts, plasma concepts	**L4**
CO4	Basic concepts of modification of Electro magnetic field equations as per relativity.	**L2**

COURSE: --PHY203-NUMERICAL METHODS AND PROGRAMING WITH C

COs	Course Outcomes (COs)	Level
CO1	Analyze the roots of transcendental equations various inter polation techniques.	**L4**
CO2	Apply concept of numerical differentiation and numerical integration for solving algebraic and differential equations.	**L3**
CO3	Fundamental concepts of C-programs and simple C-programs based on conditional structure.	**L2**
CO4	Apply Basic concepts of C-programs based on arrays and points.	**L3**

COURSE: -- PHY204-NUCLEAR AND PARTICLE PHYSICS

COs	Course Outcomes (COs)	Level
CO1	Knowledge of Various parameters of Nucleus and Apply the concept of stability of the Nucleus based on nuclear forces.	**L2**
CO2	Apply Nuclear models to explain show nucleons in the Nucleus distributed.	**L3**
CO3	Fundamental concepts of Nuclear decay and Nuclear Reactions.	**L2**
CO4	Basic concepts of elementary particles.	**L2**
CO5	Comprehension of Nuclear energy concepts and nuclear radiation detection techniques.	**L2**

COURSE: – PHY205 – MODREN PHYSICS LAB

COs	Course Outcomes (COs)	Level
CO1	Determining the wavelength of sodium doublets comparing them with the standard iron spectrum using Hartmann's dispersion formulae.	L5
CO2	Determining the specific charge of electron using CRT by Thomson's method.	L5
CO3	Determining the divergence angle of He – Ne LASER.	L5
CO4	Determining the band gap of a semiconductor using Four probe method.	L5
CO5	Determining the vibrational Raman shift from the Raman spectra of CCL_4.	L5

COURSE: -PHY206- ELECTRONICS LAB

COs	Course Outcomes (COs)	Level
CO1	Constructing The Astable Multivibrator by using IC	L6
CO2	Constructing and Study the working of Phase Shift Oscillator using IC	L6
CO3	Constructing A Wein Bridge Oscillator using operational amplifier IC	L6
CO4	Constructing and study the circuit of lowpass and highpass Filter using IC	L6
CO5	Study the Characterstics of an input voltage regulator using IC	L6

SEMESTER-III

COURSE: -PHY301-SOLIDSTATEPHYSICS

COs	Course Outcomes (COs)	Level
CO1	Comprehence Crystal structure and its classification, crystal parameters and determination of crystal parameters, reciprocal lattice concepts.	L2 & L3
CO2	Understand the lattice vibration and phonon concepts.	L2
CO3	Concepts of metals and free electron theory of metals.	L2
CO4	Classification of materials and band theory support for classification of materials.	L3
CO5	Comprehension of Super conducting materials and their properties.	L2

COURSE: -- PHY302-ATOMICAND MOLECULAR PHYSICS

COs	Course Outcomes (COs)	Level
CO1	Carry out simple atom spectrum to complex spectrum formation.	L3
CO2	Analyze atomic spectrum of variations in various types of external excitations.	L4
CO3	Knowledge fundamental concepts of molecular spectroscopy.	L2

COURSE: -PHY303-LASERS AND NON LINEAR OPTICS

COs	Course Outcomes (COs)	Level
CO1	Knowledge LASERS works and the required condition and setup for LASERS formation.	L2
CO2	Understanding the optical fiber concepts and its classification.	L2
CO3	Comprehension of Concepts of optical fibers.	L2
CO4	Comprehension of Concepts of Holography.	L2

COURSE: -PHY304-DIGITAL ELECTRONICS AND MICROPROCESSOR

COs	Course Outcomes (COs)	Level
CO1	Knowledge Various types of number system and conversion process of one number system to the another number system.	L2 & L3
CO2	Implimenting of simple combinational and sequential circuits.	L3
CO3	Implement of counters, registers and various types of data converters and characterstics.	L3
CO4	Complete concept of 8085microprocessor-architecture, address modes, data transfer schemes.	L2

COURSE: -PHY305- DIGITAL ELECTRONICS LAB

COs	Course Outcomes (COs)	Level
CO1	Verifying the truth tables of AND, OR, NOT, NAND, NOR, XOR, XNOR logic gates.	L5
CO2	Converting a given input to the binary output and studying the LED display using 7447 segment decoder.	L5
CO3	Constructing Half adder, Full adder and parallel adder using Logic gates and verifying their truth tables.	L6
CO4	Design and constructing the decade counter.	L6
CO5	Verifying the IC 74153 as multiplexer and IC 74139 as demultiplexer.	L5

COURSE:-PHY306- SOLID STATE PHYSICS LAB

COs	Course Outcomes (COs)	Level
CO1	Determining the lattice constant using powder method number of atoms per unit cycle.	L5
CO2	Determining the ultrasonic velocity in liquids with high degree of frequency.	L5
CO3	Determining the energy loss in the transformer core and ferrite core.	L5
CO4	Calculating the given g value of the given sample (DPPH) using the principle of electron spin resonance.	L5
CO5	Determining the Hall coefficient and the carrier concentration of the germanium crystal.	L5

SEMESTER-IV

COURSE:-PHY401-ADVANCED QUANTUM MECHANICS

COs	Course Outcomes (COs)	Level
CO1	The Knowledge of symmetric and anti symmetric wave function.	L2
CO2	Distinguish Various types of approximation systems where exactly schrodinger and Heisenberg approaches.	L4
CO3	Relative approach for quantum mechanics.	L3

COURSE:-PHY 402-PROPERTIES AND CHARACTERIZATION OF MATERIALS

COs	Course Outcomes (COs)	Level
CO1	Knowledge of the Thermal Analysis of materials and vacancies and color centers.	L2
CO2	Fundamental knowledge of Ferro magnetic materials.	L2
CO3	Micro scopic analysis of materials like SEM,TEM.	L4
CO4	Analysis of ESR, NMR and Mossbauer spectroscopic	L4
CO5	Analyze Electrical and Magnetic Characterization Techniques for materials.	L4
CO6	Analysis Optical Spectroscopic Techniques such as IR spectroscopy .	L4

COURSE:-PHY403-COMMUNICATION ELECTRONICS

COs	Course Outcomes (Cos)	Level
CO1	Analyze Analog communication techniques like AM, FM and PM.	L4
CO2	**:** Analyze Pulse modulation Schemes, Line coding techniques and Digital modulation schemes.	L4
CO3	Comprehension of RF Communication related issues RF Amplifier, Mixer, Filters, PLL, Local Oscillator.	L2
CO4	Comprehension of Noise and its sources, calculation of noise in various modulation schemes.	L2

COURSE:-PHY404–ANTENNA THEORY AND RADIO WAVE PROPAGATION

Cos	Course Outcomes (Cos)	Level
CO1	Knowledge of Antenna Fundamentals, Antenna Radiating power Calculations and antenna parameters	**L2**
CO2	Classifying Various types of Antenna arrays and power, Directionality and efficiencies for different arrays.	**L4**
CO3	Knowledge of Antenna impedance matching techniques	**L2**
CO4	Classify Different types of practical antenna.	**L4**
CO5	Comprehension of Noise and its sources, calculation of noise in various modulation schemes	**L2**

COURSE:- PHY405 – MICROPROCESSOR LAB

Cos	Course Outcomes (Cos)	Level
CO1	Compose an assembly language program for subtraction of two 8 – Bit numbers.	**L6**
CO2	Compose a program to add two 8 – Bit numbers stored at consecutive memory locations and summing the 16 – Bit.	**L6**
CO3	**:** Compose a program to multiply two 8-bit numbers stored at consecutive memory locations and store the result in memory	**L6**
CO4	Compose a program to find the largest 8- bit element in an array of 8-bit numbers.	**L6**
CO5	Verifying the IC 74153 as multiplexer and IC74139 as Demultiplexer.	**L5**

DANTULURI NARAYANA RAJU COLLEGE
(Autonomous)
BHIMAVARAM, W.G.DIST, ANDHRA PRADESH, INDIA, PIN- 534202.
(Accredited at 'B++' level by NAAC)
(Affiliated to Adikavi Nannaya University, Rajamahendravaram)

COURSE:- PHY406 – COMMUNICATION ELECTRONICS LAB

Cos	Course Outcomes (Cos)	Level
CO1	Perform the function of frequency modulation and demodulation and also calculate modulation index.	**L6**
CO2	Perform the characteristics of PLL and calculating capture range , Lock range and free running VCO frequency theoretically	**L6**
CO3	Perform the characteristics of pre-emphasis and De –emphasis circuits.	**L6**
CO4	Perform the function of Amplitude modulation and demodulation and also calculate the modulation index	**L6**
CO5	Generate pulse modulation signal and demodulate and pulse position modulate signal and demodulate	**L6**