



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)

PHYSICS

SEMESTER-I,

COURSE-1 THEORY (MECHANICS & WAVES AND OSCILLATIONS)

CO	COURSE OUTCOME	Level
CO1	Examine the applications of rotator motion, Collisions and the Variable mass system.	L3
CO2	Apply the principles of central forces to planetary motion, Satellites and to GPS.	L3
CO3	Use Michelson interferometer to analyze the variation of light velocity , mass and energy equivalence.	L4
CO4	Illustrate the concept of oscillations, Resonance and Coupled Oscillations.	L2
CO5	Understand the Laws of Vibrations of Stretched string.	L2
CO6	Examining the applications of ultrasonics in various fields.	L3

COURSE-1 LAB (MECHANICS & WAVES AND OSCILLATIONS LAB)

CO	COURSE OUTCOME	Level
CO1	Perform experiments on properties of matter such as the determination of moduli of elasticity viz. young's modulus , Rigidity modulus of certain materials, coefficients of viscosity of a liquid, moment of inertia of some regular bodies by different methods.	L5
CO2	Determine the acceleration due to gravity at a place using compound pendulum.	L5
CO3	Identify the difference between flat resonance and sharp resonance in case of volume resonator and sonometer experiments	L4
CO4	Demonstrate the formation of stationary waves on a string in melde's experiment.	L5
CO5	Observe the motion of coupled oscillator and normal modes	L4
CO6	Find the velocity of transverse waves along a stretched string and verify laws of strings by using sonometer.	L6



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SEMESTER-II

COURSE-2 THEORY (WAVE OPTICS) ,

CO	COURSE OUTCOME	Level
CO 1	Analyze the Phenomenon of interference and its applications in various optical systems and devices.	L4
CO 2	Apply the principles of Frounhoffer diffraction to analyze diffraction patterns formed by single slit, grating and Apply Fresnel's half period zones to explain the action of zone plate	L3
CO 3	Apply the polarization of light in different optical instruments like polarimeter.	L3
CO 4	Analyze the methods for minimization of aberrations.	L4
CO 5	Demonstrate the concept of Fiber optics and its applications.	L2
CO 6	Apply the Principles of Laser in real time applications	L3

COURSE-2 LAB(WAVE OPTICS LAB)

CO	COURSE OUTCOME	Level
CO1	Gain hands-on experience of using various optical instruments like travelling microscope, spectrometer, polarimeter.	L5
CO2	Observe dispersion of white light, spectra of different materials like sodium,mercury and difference between prism , diffraction grating spectra.	L5
CO3	Determine the wavelength of monochromatic light, specific rotatory power of different optical active substances.	L5
CO4	Determine the resolving power of telescope,grating and dispersive power of material of the prism.	L5
CO5	Determine refractive index of liquids by different methods.	L5
CO6	Determine thickness of thin wires and radius of curvatures of lenses using interference principle.	L5



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SEMESTER-III

COURSE:3 THEORY (HEAT & THERMODYNAMICS),

CO	COURSE OUTCOME	Level
CO 1	Analyze Transport Phenomena in ideal gases such as Viscosity, Thermal conductivity, Diffusion which is based on Kinetic theory of gases.	L4
CO 2	Analyze Carnot's engine and its efficiency which is based on Carnot's Cycle.	L4
CO 3	Calculate changes in entropy during Phase transitions , Interpret Temperature – Entropy diagrams and their uses.	L3
CO 4	Derive Maxwell's Thermodynamic relations from thermodynamic potentials and apply these relations to solve various problems in thermodynamics.	L3
CO 5	Explore the Production of low temperatures by different methods like Joule-Thomas effect , Adiabatic demagnetization and analyze practical applications of substances at low temperature.	L4
CO 6	Derive plank's Law of black body radiation and deduce Wien's law , Rayleigh- jeans law from Planck's law.	L3

COURSE-3 LAB (HEAT & THERMODYNAMICS LAB)

CO	CO Statement	Level
CO1	Perform some basic experiments in thermal Physics.	L5
CO2	Determine Stefan's constant, coefficient of thermal conductivity of bad conductors.	L5
CO3	Explain variation of thermo-emf of a thermocouple with temperature difference at its two junctions.	L5
CO4	Determine Specific heat of a liquid by applying Barton's radiation correction.	L5
CO5	Determine efficiency of electrical kettle.	L5
CO6	Study variation of resistance with temperature by using thermistor.	L5



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SEMESTER-IV

COURSE:4 THEORY(ELECTRICITY ,MAGNETISM & ELECTRONICS),

CO	COURSE OUTCOME	Level
CO 1	Calculate the Electric field intensity due to uniformly charged bodies like sphere, sheet of a charge by applying Gauss law and also calculate the Electric potential by applying principles in electrostatics.	L3
CO 2	Calculate the capacitance in the presence of dielectric and derive the relation between three electric vectors , dielectric constant and electric susceptibility.	L3
CO 3	Understand Biot-Savat's law and its applications , Hall effect.	L2
CO 4	Analyze self inductance and Mutual inductance Phenomena.	L4
CO 5	Differentiate LCR series, parallel circuits in A.C. and derive Electromagnetic wave equation, Poynting theorem.	L2
CO 6	Understand the working and characteristics of different semiconducting devices like diodes , Transistors and also understand number systems, Boolean algebra, Logic circuits using different gates.	L2

COURSE-4 LAB (ELECTRICITY ,MAGNETISM & ELECTRONICS LAB)

CO	COURSE OUTCOME	Level
CO1	Measure the current sensitivity and figure of merit of moving coil Galvanometer.	L5
CO2	Observe the resonance condition in LCR series and parallel circuits.	L4
CO3	Learn how sonometer can be used to determine the frequency of A.C supply.	L5
CO4	Observe the variation of magnetic field along the axis of a circular coil carrying current using Stewart and Gee's apparatus.	L4
CO5	Determine resistances in forward and reverse bias by Understanding the operation of PN junction diode, Zener diode and a transistor and their V- I characteristics	L5
CO6	Construct the basic logic gates, half adder and full adder and verify their truth tables. Further, the student will understand how NAND and NOR gates can be used as universal building blocks.	L6



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SEMESTER-IV

COURSE:5 THEORY(MODERN PHYSICS)

CO	COURSE OUTCOME	LEVEL
CO 1	Understand atomic models, Raman effect , Zeeman effect .	L2
CO 2	Develop critical understanding of de Broglie's Hypothesis no.of matter waves , uncertainty principle.	L3
CO 3	Apply the postulates of quantum mechanics and Schrodinger wave equation to one dimensional systems	L3
CO 4	Understand Nucleus structure, Nuclear forces , Nuclear models.	L2
CO 5	Understand the types of super conductors and their applications.	L2
CO 6	Understand the concept of Nano materials, Properties, classifications and applications.	L2

COURSE-5 LAB (MODERN PHYSICS LAB)

CO	COURSE OUTCOME	Level
CO1	Measure e/m value of an electron by Thomson method.	L5
CO2	Determine the Planck's constant using Photocell and LEDs.	L5
CO3	Study the absorption of α -rays and β -rays, Range of β -particles and the characteristics of GM counter	L4
CO4	Determine the Energy gap of a semiconductor using thermistor and junction diode.	L5
CO5	Determine the magnetic moment (M) and horizontal component of earth's magnetic field(H) using deflection magnetometer.	L5
CO6	Verify inverse square law of light .	L5



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SEMESTER-V

COURSE:6C THEORY(APPLICATIONS OF ELECTRICITY & ELECTRONICS)

CO	COURSE OUTCOME	Level
CO 1	Understand active and passive elements, types of resistors, capacitors, inductors and their applications.	L2
CO 2	Understand different types of AC and DC sources like Batteries ,SMPS and their applications.	L2
CO 3	Understand the construction , working principles , applications of Generators, Motors , Transformers.	L2
CO 4	Understand the need and functionality of Various DC & AC power sources.	L2
CO 5	Understand the principles and construction of different types of motors and Generators.	L2
CO 6	Comprehend the design , applications and practices of various electrical & Electronic devices and also their trouble shootings.	L2

COURSE-6C LAB (APPLICATIONS OF ELECTRICITY & ELECTRONICS LAB)

CO	COURSE OUTCOME	Level
CO1	List out, identify and handle various equipment in Electrical & Electronics laboratory.	L6
CO2	Design simple electrical circuits.	L6
CO3	Design electronic circuits using different soldering techniques.	L6
CO4	Explain the need & Functionality of various DC & AC Power sources.	L6
CO5	Choose the electrical components in designing various circuits by acquiring critical knowledge of each component and its utility (like resistors, capacitors, inductors, power sources etc.).	L6
CO6	Construct step down transformers by understanding the principle of mutual induction .	L6



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SEMESTER-V

COURSE:7C THEORY(ELECTRONIC INSTRUMENTATION),

CO	COURSE OUTCOME	Level
CO 1	Understand the electronic instruments like voltmeters, multimeters (analog & digital), function generators and their applications in electronic measurements and testify.	L2
CO 2	Demonstrate skills of using instruments like CRO, Function generator, Multimeter.	L2
CO 3	Understand classification and selection of transducer in real time applications.	L2
CO 4	Understand the principle and operation of display devices used in the display systems.	L2
CO 5	Comprehend the applications of various biomedical instrument in daily life like B.P machine, E.C.G, Pulse oxymeter and know the handling procedure with safety and security.	L2
CO 6	Identify various facilities required to set up a basic instrumentation laboratory by acquiring critical knowledge of various electrical and electronic instruments used in the laboratory.	L2

COURSE-7C LAB(ELECTRONIC INSTRUMENTATION LAB)

CO	COURSE OUTCOME	Level
CO1	List out, identify and handle various equipment in Instrumentation Laboratory or Electronic Laboratory.	L6
CO2	Explain the construction, operational principles of various instruments.	L5
CO3	Demonstrate skills on handling, Maintenance & troubleshooting of different instruments used in the Labs.	L5
CO4	Acquire skills in observing and measuring various electrical and electronic quantities.	L6
CO5	Perform some techniques related to Biomedical Instrumentation and measurement of Certain physiological parameters like body temperature, B.P. and sugar levels etc.	L6
CO6	Construct different circuits in digital electronics like seven segment display by using different logic gates.	L6