Department of Physics
Govt. V.Y.T. PG Autonomous College,Durg (C.G.)

Vision

To foster and inculcate scientific temperament,logical thinking, intellectual adventure,enhance employability through skill development in the students and also make them responsible citizens

Mission

- To provide quality education to the students in a creative and stimulating environment
- To promote research work
- To provide a conducive atmosphere for the preparation of competitive exams viz. NET/SET/PSC

Programme Outcomes (POs)

M.Sc

PO1: Knowledge: Acquire an overview of concepts, fundamentals and advancements of science across a range of fields, with in-depth knowledge in at least one area of study. Develop focused field knowledge and amalgamate knowledge across different disciplines.

PO2: Complementary skills: Students will be able to engage in critical investigation through principal approaches or methods and through effective information search and evaluation strategies. Employ highly developed conceptual, analytical, quantitative and technical skills and are adept with a range of technologies

PO3: Applied learning: Students will be able to apply disciplinary or interdisciplinary learning across multiple contexts, integrating knowledge and practice. Recognize the need for information;

effectively search for, evaluate, manage and apply that information in support of scientific investigation or scholarly debate

PO4:Communication: Communicate effectively on scientific achievements, basic concepts and recent developments with experts and with society at large. Able to comprehend and write reports, documents, make effective presentations by oral and/or written form.

PO5: Problem-solving: Investigate, design and apply appropriate methods to solve problems in science, mathematics, technology and/or engineering.

PO6: Environment and sustainability: Understand the impact of the solutions in ethical, societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.

PO7: Teamwork, collaborative and management skills: Recognize the opportunities and contribute positively in collaborative scientific research. Engage in intellectual exchange of ideas with researchers of other disciplines to address important research issues

Programme Specific outcomes

PSO1 Students are expected to acquire core knowledge in modern physics, including the major premises of classical mechanics, electromagnetic theory, and optical electronics.

PSO2 Students are also expected to develop written and oral communication skills in optical fibre communicating physics-related topics.

PSO3 Students would learn how to design and conduct an experiment (or series of experiments) demonstrating their understanding of the scientific method and processes.

PSO4 Students are expected to understand the analytical methods required to interpret and analyze results and draw conclusions as supported by the experimental data or existing theories.

COURSE OUTCOMES

SEMESTER-I

MPH101: Mathematical Physics

Students will be able to :

CO1 Determine the continuity, differentiability of functions, find the complementary function of PI and LDE.

CO2 Learn to derive solution by series expansion and Legendre, Bessel's, Hermite and Lagurre equation and physical applications of Legendre, Hermite and Lagurrespolinomials.

CO3 Analyze - Basic idea of Group, finite and infinite decimal Vector space and Subspace. Basic idea about matrix Compute eigen Values and eigen vectors, characteristic polynomials and apply to basic digonalization of matrix

CO4 Distinguish the integral of infinite order into general and singular integrals. Solve and apply linear equation of order two and higher LDE using Laplace's Transformation. Perform Transforms like Laplace's Transformation, Fourier series, Fourier Transformations. Get familiar with the modelling assumption and derive the idea to PDE.

MPH102: Classical Mechanics

Students will be able to :

CO1 Know the effect of forces during static conditions and Understand the true nature of Newtonian mechanics, Lagrangian and Hamiltonian approaches in classical mechanics.

CO2 Apply Langragian Equation and solve Kinematics and Dynamics of rigid body in detail and ideas regarding Euler's equations of motion

CO3 Reduce dynamics of many body problem to single body and apply it to solve Planetary Motions

CO4 Understand Principle of least action and transformations from one set to another and implement it to theory of small oscillations in detail along with basis of Free vibrations

MPH103: Quantum Mechanics

Students will be able to :

CO1 Get familiarize with basic non-relativistic quantum mechanics, old quantum theory, interpretation of wave function, uncertainty principle in quantum mechanics and commutation relations.

CO2 Appreciate Dirac delta function, box normalization, Hilbert space, matrix mechanics, Schrodinger, Heisenberg and interaction pictures, particle in a box, tunneling through a potential barrier, linear harmonic oscillator.

CO3 Develop the idea of symmetry in space and time, spherical harmonics, angular momentum, addition of angular momenta and Clebsch-Gordon coefficients.

CO4 Understand the basic concepts of hydrogen atom in quantum mechanics, time independent perturbation theory and its applications to harmonic oscillator, Zeeman effect without spin and Stark effect.

MPH104: Electronic Devices

Students will be able to :

CO1 Understand transistor and diode characteristics and apply it to design electronic circuits and microwave devices of desired configurations.

CO2 Identify and model various Photonic devices , their working principle and applications in numerous present day technologies .

CO3 Implement laws of Boolean algebra for reduction for various logic circuits and create K-Map .

CO4 Recognize microprocessor 8085 and its basic working along with familiarization of all type of memory devices.

MPHL01: Lab Course A General

Students are expected to understand various theory and principles concerned with mechanics, optics and semiconductor electronics and will be able to following in connection of the same.

CO1 Design and resolve circuits for electronic applications.

CO2 Record data as required by the experimental objectives.

CO3 Analyse recorded data and formulate it to get desired results.

CO4 Interpret results and check for attainment of proposed objective.

SEMESTER-II

MPH201: Quantum Mechanics

Students will be able to :

CO1 Familiarize with time independent perturbation theory and Fermi-Golden rule, variation method, WKB approximation as well as adiabatic and sudden approximations.

CO2 Introduce laboratory and centre of mass frames, scattering cross-sections, partial wave analysis, Born approximation.

CO3 Develop the idea of identical particles in quantum mechanics and their collision, spin angular momentum, Pauli pin matrices, effect of identity and spin.

CO4 Understand the basic concepts of semi classical theory of radiation and electric dipole transition, line width, quantization of electromagnetic field, creation and annihilation operators, spontaneous and stimulated emissions.

MPH202: Statistical Mechanics

Students will be able to :

CO1 Classify a system into canonical, micro canonical, Grand Canonical ensembles and write partition function for them.

CO2 Describe Gibbs's paradox, Phase space Liouvelle's theorem, Maxwellian distribution from canonical distribution and understand transition to Quantum statistical mechanics.

CO3 Derive and discuss Virial equation , cluster expansion for a classical gas,theIsing model in one dimension, exact solution of Ising model in one dimensions and Landau's Phenomenological theory of phase transition.

CO4 Summarize and outline thermodynamic fluctuations spatial correlation in a fluid, Langevin's theory of the Brownian motion, Einstein Relation and Expression for mobility(Nernst relation) Fokker – Planck equation and Fluctuation dissipation theorem.

MPH203: E.D. and Plasma

Students will be able to :

CO1 Review and illustrate Lorentz transformation of space and time and Maxwell's field equations in terms of four vectors, electromagnetic field tensor, Lienard - Wiechert Potential.

CO2 Explain Motion of charged particles in E-M field and theories related to Larmour's formula, relativistic generalization of Larmour's formula, Bremrstrahlung radiation, Synchrotron Radiation, Cerenkev radiation, Abraham- Lorentz formula.

CO3 Get Idea of Plasma Production, theories related to application of EM fields and appreciate the difficulties related to it.

CO4 Explain Phase Space for Single particle and many particle phase space and Derive CollisionlessBoltzman equation, the Vlasov equation, continuity equation. theSaha ionization equation.

MPH204: Atomic and Molecular Physics

After successful completion of the course, the student is expected to:

CO1 know about different atom model and will be able to differentiate different atomicsystems, different coupling schemes and their interactions with magnetic and electric fields.

CO2 Have gained ability to apply the techniques of microwave and infraredspectroscopytoelucidate the structure of molecules

CO3 Be able to apply the principle of Raman spectroscopy and its applications in the differentfield of science & Technology.

CO4 To become familiar with different resonance spectroscopic techniques and its applications to find solutions to problems related different spectroscopic systems.

MPHL02: Lab Course B Electronics

Students are expected to understand working mechanicsand factors governing semiconductor electronics devices and in connection of the same students are expected to

CO1 Design and resolve circuits for electronic applications.

CO2	Record data as required by the experimental objectives.
CO3	Analyse recorded data and formulate it to get desired results.
CO4	Interpret results and check for attainment of proposed objective.

SEMESTER-III

MPH301: Solid State Physics

This course acts as a bridge between a physicist and a material scientist. After successful completion of the course, the student is expected to:

CO1	have basic knowledge of crystal systems and spatial symmetries,- be able to account for how crystalline materials are studied using diffraction, including concepts like reciprocal lattice and Brillouin zones
CO2	know what phonons are, and be able to perform estimates of their dispersive and thermal properties, be able to calculate thermal and electrical properties in the free-electron model
CO3	know Bloch's theorem and what energy bands are and know the fundamental principles of semiconductors and explain superconductivity using BCS theory
CO4	Understand basic models of dia, para and ferro magnetism and theories of spin waves, Bloch laws and classify them.

MPH302: Nuclear Physics

After successful completion of the course the student is expected to

CO1	Acquire clear understanding of nuclear interaction, scattering and correlate data to retrieve information about nuclear structure.
CO2	Visualize nuclear models with the help of various experimental evidences.
CO3	Acquire knowledge about nuclear decay processes and build idea about nuclear phenomena.
CO4	Recognize different interactions of elementary particles and classify them based on their characteristics.

MPH303: Special Paper-I (Electronics)

After successful completion of the course the student is expected to

CO1	Know and discuss differential amplifier circuits.
CO2	Apply knowledge of OPAMP and analyse its block diagram and different configurations
CO3	Understand and explain Summing Amplifier, Differentiator, Integrator, Clipping Clamping circuits, Multi-vibrators

CO4 Describe and discuss applications of OP-AMP as oscillators in all configurations.

MPH304:Special Paper-II (Electronics)

After successful completion of the course, the student is expected to

CO1 Understand different types of Flip-flops and apply them in shift registers and counters

CO2 Discuss working of Optoeelctronic devices and design digital display units.

CO3 Analyse Principles microwave communication systems.

CO4 Discuss and demonstrate principle and arrangements of radar system.

MPHL02: Lab Course A General

Students are expected to understand working mechanics and factors governing electrical, semiconductor electronic devices and Optical phenomenon. In connection of the same students are expected to

CO1 Design and resolve circuits for electronic applications.

CO2 Record data as required by the experimental objectives.

CO3 Analyse recorded data and formulate it to get desired results.

CO4 Interpret results and check for attainment of proposed objective.

SEMESTER-IV

MPH401: Laser Physics & Application of Laser

After successful completion of the course, the student is expected to

CO1	Understand and explain basic Laser principles, Laser behaviour, Properties of laser radiations, Different types of Lasers and Laser applications
CO2	Explain different types Laser used and make a comparison between them.
CO3	Develop familiarity with the vast areas of laser application , especially in spectroscopy
CO4	Explore important connections between theory, experiment, and current applications of laser

MPH402: Computational Methods & Programming

After successful completion of the course, the student is expected to

CO1	Learn and apply different numerical methods such as Newton for physical problems.
CO2	Understand and analyze data by interpolation and curve fitting etc.
CO3	Learn and solve ODE using Picard's Method, Taylor Series expansion
CO4	Apply Newton's forward and backward difference formula , Stirling's formula for numerical differentiation . Use trapezoidal and Simpson's rule for numerical Integration.

MPH403: Special Paper- Electronics

After successful completion of the course, the student is expected to

CO1	Get familiarized with Amplitude Modulation, its principle and applications
CO2	Present mathematical representation of different modulation techniques.
CO3	Learn and apply sampling theorem for Mathematical representation of of FM and PM signal, inter system comparison (FM & AM) generation of FM direct & indirect method.
CO4	Understand and compare different computer communication systems viz. LAN, WAN and MAN, Wireless network, Network topology, etc.

MPH404A: Electronics

After successful completion of the course, the student is expected to

CO1 Explain Architecture and pin diagram of 8086 Microprocessor.

CO2 Analyse addressing modes and instructions of advanced Microprocessors.

CO3 Learn and Understand memory Interfaces of 8088 & 8086 and Basic idea about 32 bit and 64 bit memory interfaces.

CO4 Understand and present I/O interface, basic descriptive idea of Peripheral interface like 8255,8279(key board display) 8255(Functional description only)

MPH404B: INFORMATICS (DATA COMMUNICATION)

After completion of this course, the student is expected to

CO1 Understand and explain switching circuits and propagationdelay .

CO2 Learn and Discuss network access control and optical fiber communication

CO3 Explain rate of transmission band width and Hartley Shamon law.

CO4 Apply methods for error correction codes for line control and network overview.

MPH404C: PHYSICS OF LIQUID CRYSTALS

After completion of this course, the student is expected to

CO1 Describe the structures, symmetries, order, and phase transitions of the most important liquid crystal phases

CO2 Understand the basic electric, elastic, and optical properties of liquid crystal materials

CO3 Explain the structure and function of liquid crystal displays and devices.

CO4 Discuss questions and problems related to liquid crystal science and applications, and to propose solutions/draw sound conclusions by combining knowledge of liquid crystal physics.

MPH404D: PHYSICS OF NANOMATERIALS I

CO1 Describe nanomaterial structures, their synthesis techniques and develop ideas for newer methods

CO2 Illustrate and present distinguishing features of carbon nanostructures. Analyse its electrical, mechanical and vibrational properties

CO3 Realize effect of compositions of different bulk nanostructures and present its application.

CO4 Present theoretical interpretation of quantum well, quantum dots and wires and apply it for infrared detectors and superconductivity.

MPH404E: ATOMSPHERIC SCIENCE

CO1 Apply laws of thermodynamics to explain adiabatic processes and heat balance of earth-atmosphere system. Understand circulation theorem, voracity and continuity of energy equations for dynamic meterology.

CO2 Understand and explain monsoon dynamics and numerical methods and atmospheric models.

CO3 Enumerate role of meteorology on atmospheric pollution. Understand and explain working of environmental instrumentation systems.

CO4 Describe radar principle of radar technology , signal processing and its application.

MPH404F: Astronomy and Astrophysics

CO1 Appreciate H-R diagram and analyse it for stellar distribution. Explain basic equations relating to stellar interiors.

CO2 Understand and explain formation and evolution of stars

CO3 Describe and classify life cycle of stars and its various state. Also able to decide its end life.

CO4 Discuss and explain solar physics related to its magnetic field, winds and chromosphere.

The Program Specific Outcomes of B.Sc. Physics

The syllabi are framed in such a way that it bridges the gap between plus two and post graduate levels of Physics by providing a more complete and logical framework in almost all areas of basic Physics:

PSO1 To develop interest and craving for thorough knowledge in students about the importance and scope of the subject.

PSO2 To equip students to handle the apparatus and build experimental approach in day today things too.

PSO3 To develop skill in in practical work, experiments and laboratory use of Physics.

PSO4 To render the students to use different processes used in the industry according to the present requirement.

In this way the course provides with ample opportunities for the student to learn about the basic laws of Physics and how to handle the instruments and proper functioning of the simple instruments.

Course Outcomes of B.Sc. Part I Physics

BPH01: Mechanics, Oscillations and Properties of Matter

After completion of the course, Students will be able to:

CO1 Understand basic concept of Newtonian Mechanics and apply it on other physical system.

CO2 Understand Rigid Body Motion, Rotation motion and Simple Harmonic Oscillation.

CO3 Understand Lissajous figure and its application, derive differential equation and its solution for damped and forced harmonic Oscillator.

CO4 Understand the basic theory apply in CRO.

CO5 Understand the theory and application of Elasticity and Viscosity.

BPH02: Electricity, Magnetism and Electromagnetic Theory

After the completion of the course, Students will be able to:

- CO1 Able to formulate equation to address force between charged particles.
- CO2 Calculate energy and intensity of electrostatic field for a given charged particles/ group of charges
- CO3 Understand Gauss's law and its implication in problem solving.
- CO4 Explain various phenomenon like Ferromagnetism, anti-ferromagnetism and differentiate among them
- CO5 Confidently apply mathematical methods to solve electromagnetic problems and appreciate the basic concept of magnetism and Maxwell equations and explain various phenomenon considering Maxwell equations.

BPHL01: Lab Course

After the completion of the course, Students are expected to understand working mechanism and factors governing electrical circuits and laws of classical mechanics.In connection of the same students are expected to

- CO1 Design and resolve circuits for electronic applications.
- CO2 Record data as required by the experimental objectives.
- CO3 Analyse recorded data and formulate it to get desired results.
- CO4 Interpret results and check for attainment of proposed objective.

Course Outcomes of B.Sc. Part II Physics

BPH03: Thermodynamics, Kinetic Theory and Statistical Physics

After completion of the course, Students will be able to:

- CO1 Associate with different laws of Thermodynamics, compare them and correlate phenomena observed in past. Explain working of Carnot's engine and derive efficiency in different situations.
- CO2 Identify thermodynamic variables and appraise various relations for gaseous system.
- CO3 Acquire a thorough knowledge of Black body radiation and laws associated with it.
- CO4 Describe Maxwellian distribution of speeds and distinguish between mean, r.m.s. and most probable speed values, Compute molecular collisions, mean

free path and collision cross sections and estimate molecular diameter and mean free path.

CO5 Interpret the statistical basis of thermodynamic probability and enlist statistical postulates of Gibb's ensemble. Derive Maxwell Boltzmann statistical laws and describe Bose Einstein and Fermi Dirac statistics through canonical partition function

BPH04: Waves, Acoustics and Optics

After completion of the course, Students will be able to:

CO1 Express waves in form of equation and interpret the solutions and determine values of parameters.

CO2 Appreciate the use of Fermat's Principle of extremum path to derive basic laws of optics, Investigate cardinal points for various coaxial lens systems.

CO3 Demonstrate different type of interferences and interpret interference results using Michelson interferometer and Fabry-Parot Interferometer.

CO4 Describe and demonstrate diffraction of light. Compare Fresnel half period zones with,Fraunhofferdiffractions. Evaluate Resolving powers using Rayleigh criterion.

CO5 Understand and explain working of a Laser system, Assemble various parts for its efficient working. Analyze its **a**pplication in communication technology

BPHL02: Lab Course

After the completion of the course, Students are expected to understand working mechanism and factors governing Thermodynamics and Optics (both geometrical and wave). In connection of the same students are expected to

CO1 Design and resolve circuits for electronic applications.

CO2 Record data as required by the experimental objectives.

CO3 Analyse recorded data and formulate it to get desired results.

CO4 Interpret results and check for attainment of proposed objective.

Course Outcomes of B.Sc. Part III
Physics

BPH05: Relativity, Quantum Mechanics, Atomic Molecular and Nuclear Physics.

After completion of the course, Students will be able to:

CO1 Describe laws of special theory of relativity and deduce its consequences in various situations and apply it for Compton's shift.

CO2 Enumerate various events leading to Origin of the quantum theory. Appreciate wave particle duality and compute wavelengths using it and develop further understanding for wave packets. Correlate uncertainty.

CO3 Write Schrodinger wave equation and solve it for obtaining different measurable parameters for a given system.

CO4 Apply Schrodinger equation for some higher order problems like Spectra of hydrogen, deuteron and alkali atoms and its fine structure. Explain transition rule for pure vibration and electronic vibration spectra. Estimate and evaluate spectral lines from spectroscopy and analysis the theory underlining it.

CO5 Utilize knowledge of particle interaction with electrostatic field in their detection and discrimination. Understand and describe working of detectors.

BPH06: Solid State Physics, Solid State Devices and Electronics

After completion of the course, Students will be able to:

CO1 Characterize and classify Seven Systems, apply Laue's equation/ Bragg'sLaw of X-ray diffraction to identify crystal planes, Associate bonding in solids with specific heat of solids laws related to it.

CO2 Derive expression for density of states for solids, discuss kronig – penny model and distinguish Metal, Insulator and semiconductors. Classify Dia, Para and ferromagnetism. Investigate Langevin's theory of dia and para-magnetism and description of Curieweiss's law, B-H.curve and Hysteresis loss.

CO3 Describe and classify Semiconductors, explain working of n-type and p-types, diodes and transistor junction potentials. Apply its knowledge to solve given problems based on its working.

CO4 Apply knowledge of V-I characteristics of PN junction diode, Zener Diode, Capacitor and Inductor to understand working of half wave and Full wave rectifiers and regulation of voltage. Calculate voltage and current gain for transistor configurations.

CO5 Construct a number system and formulate conversion mechanism mathematical operations for it. Explore Logical operations by basic gates and express combination of gates using Boolean Algebra. Appreciate Digital Circuits and its use in ICs

BPHL03: Lab Course

After the completion of the course, Students are expected to understand working mechanism and factors governing Electronic circuits and its application. In connection of the same students are expected to

CO1 Design and resolve circuits for electronic applications.

CO2 Record data as required by the experimental objectives.

CO3 Analyse recorded data and formulate it to get desired results.

CO4 Interpret results and check for attainment of proposed objective.

The ProgramSpecific Outcomes of B.Sc. Electronics

The syllabi are framed in such a way that it smoothly introduces electronics and communication of semiconductor electronics and its application form basics to advance and present day

:

PSO1 To develop interest and craving for thorough knowledge in students about the importance and scope of the subject.

PSO2 To equip students to handle the apparatus and build experimental approach in day today things too.

PSO3 To develop skill in in practical work, experiments and laboratory use of Physics.

PSO4 To render the students to use different processes used in the industry according to the present requirement.

In this way the course provides with ample opportunities for the student to learn about the basic laws of Physics and how to handle the instruments and proper functioning of the simple instruments.

Course Outcomes of B.Sc. Part I Electronics

BEL-01: Network Analysis and Analog Electronics

After the completion of the course, Students will be able to

CO1 Apply their knowledge in analysing Circuits by using network theorems.

CO2 Understand working and applications of Junction Diodes.

CO3 Understand the current voltage characteristics of all types of Transistors in various configuration..

CO4 Explain baising, stabilization and working of transistors for various applications.

CO5 Describe and determine condition for oscillations and explain the concept of feedback amplifier and their characteristics.

BEL-02: Linear and Digital Integrated Circuits

After the completion of the course, Students will be able to

- CO1 Define the basic concepts related to Op-amp andexplain the working of op-amp based circuits.
- **CO2** Understand fundamentals of Number Systems, Boolean algebra and minimization techniques.
- CO3 Understand and design combinational logic gates and their utility.
- CO4 Design combinational and sequential digital circuits.
- **CO5** Understand working and applications of analog to digital and digital to analog converters.

BELL01: Lab Course

After the completion of the course, Students are expected to understand working mechanism and factors affecting diode and transistor circuit for various applications. In connection of the same students are expected to

- CO1 Design and resolve circuits for electronic applications.
- CO2 Record data as required by the experimental objectives.
- CO3 Analyse recorded data and formulate it to get desired results.
- CO4 Interpret results and check for attainment of proposed objective.

Course Outcomes of B.Sc. Part II Electronics

BEL-03 : Communication Electronics

After the completion of the course, Students will be able to

- **CO1** The different modulation and demodulation techniques used in analogand digital communication.
- **CO2** Explain the basics of satellite communication.
- **CO3** Understand GSM, CDMA, TDMA0 and F
- **CO4** DMA concepts.
- **CO5** Study of evolution of mobile communication generations 2G, 3G and 4G with their characteristics and limitations.

BEL-04: Microprocessor and Microcontroller

After the completion of the course, Students will be able to

CO1 Understand and explain organization and architecture of 8085 microprocessor.

CO2 Develop an assembly language program in 8085 microprocessor using the internal organization for the given specification.

CO3 Describe the architecture and functional block of 8051 microcontroller.

CO4 **Design and develop** assembly language programing for 8051 microcontroller using the internal functional blocks for the given specification.

CO5 Develop and write programming in C for 8051for ASCII and BCD conversions. Familiarized to embedded systems and their classification.

BELL02: Lab Course

After the completion of the course, Students are expected to understand working mechanism and factors operating Logic gates, Flip flops, oscillators and converter circuits for various applications. In connection of the same students are expected to

CO1 Design and resolve circuits for electronic applications.

CO2 Record data as required by the experimental objectives.

CO3 Analyse recorded data and formulate it to get desired results.

CO4 Interpret results and check for attainment of proposed objective.

Course Outcomes of B.Sc. Part III Electronics

BEL-05 : Power Electronics, Microprocessor and it Fundamental's

After the completion of the course, Students will be able to

CO1 Acquire knowledge about various power semiconductor devices.

CO2 Develop an assembly language program in 8085 microprocessor.

CO3 Explain various peripherals devices such as 8155, 8355 and 8279.

CO4 Understanding of different types of computer networks and computer network models.

CO5 Explain communication technology like LAN, WAN and MAN.

Paper-II: Communication System

After the completion of the course, Students will be able to

CO1 Understand the effects of noise in communication system.
CO2 Understand and explain AM, SSB systems and their quantitative analysis.
CO3 Comprehend angle modulation and demodulation circuits**.**
CO4 Understand and illustrate digital communication techniques.
CO5 Appreciate and explain television engineering like scanning process and interlaced scanning.

BELL01: Lab Course

After the completion of the course, Students are expected to understand working mechanism and factors affecting UJT and communication systems and their units. In connection of the same students are expected to

CO1 Design and resolve circuits for electronic applications.

CO2 Record data as required by the experimental objectives.

CO3 Analyse recorded data and verify it.

CO4 Interpret results and check for attainment of proposed objective.