



**NETAJI SUBHAS INSTITUTE OF TECHNOLOGY
AMHARA, BIHTA, PATNA**

Bihar Engineering University

B. Tech.

**DEPARTMENT OF
ELECTRONICS & COMMUNICATION ENGINEERING**

List of Course Outcomes

1st Semester:-

Course Name: Chemistry		Course Code-100103
The outcomes of the Course / Subject are:		
C01	Analyze the need, design and perform a set of experiments	
C02	Learn and apply basic techniques used in chemistry laboratory for volumetric analysis; redox titrations with different indicators; EDTA titrations	
C03	Enhance the thinking capabilities in the modern trends in Engineering & Technology	
C04	Expose to different methods of chemical analysis and use of some commonly employed instruments	
C05	Explain and demonstrate a few instrumental methods of chemical analysis.	
C06	Function as a member of a team, communicate effectively and engage in further learning. Also, learn safety rules in the practice of laboratory investigations	

Course Name: Chemistry		Course Code-100103P
The Laboratory outcomes of the Course / Subject are:		
L01	Determine the chloride content of water.	
L02	Learn and apply basic techniques used in chemistry laboratory for volumetric analysis; redox titrations with different indicators; EDTA titrations	
L03	Expose to different methods of chemical analysis and use of some commonly employed instruments.	
L04	Synthesize a small drug molecule and analyze a salt sample	
L05	Estimate rate constants of reaction from concentration of reactant such as surface tension and viscosity	

Course Name: Mathematics -I		Course Code-103102
The outcomes of the Course / Subject are:		
C01	Discuss the applications of mean value theorems to the mathematical problem, Evaluation of improper integrals using Beta and Gamma functions.	
C02	Basic concept of convergence and Divergence, and Discuss the applications of convergence of sequence and series ,half range sine and cosine series	
C03	Examine the extreme of functions of two variables with / without constraints.	
C04	Discuss the double and triple integrals and its applications	
C05	Classifies the differential equation ,ODE and PDE and Discuss the different types of problems ODE and PDE and understand that physical system ,practical importance and boundary value problem	

Course Name: Programming for problem solving		Course Code-100104
The outcomes of the Course / Subject are:		
C01	Illustrate and explain the basic computer concepts and programming principles of C language.	
C02	Develop C programs to solve simple mathematical and decision making problems.	
C03	Develop C programs to solve simple engineering problems using looping constructs.	
C04	Develop C programs to demonstrate the applications of derived data types such as arrays, pointers, strings and functions.	

Course Name: Programming for problem solving		Course Code-100104 P
The Laboratory outcomes of the Course / Subject are:		
L01	Develop a C program	
L02	Control the sequence of the program and give logical outputs	
L03	Implement strings in your C program	
L04	Store different data types in the same memory	
L05	Manage I/O operations in your C program	
L06	Repeat the sequence of instructions and points for a memory location	
L07	Apply code reusability with functions and pointers	
L08	Understand the basics of file handling mechanisms	
L09	Explain the uses of pre-processors and various memory models	

Course Name: Workshop Manufacturing Practices		Course Code-100105
The outcomes of the Course / Subject are:		
C01	Understand the appropriate tools, materials, instruments required for specific operations in workshop.	
C02	Define practical skills in various machining operations and safety consciousness and show team work.	
C03	Understand the figures of the hand tools used in fitting, carpentry, black smithy, foundry, welding shop and machine tools such as lathe machine and drilling machine etc.	
C04	Apply different manufacturing techniques and measuring instruments for making a job.	
C05	Discriminate solution for real engineering problems using machine and equipments in workshop.	

Course Name: Workshop Manufacturing Practices		Course Code-100105P
The Laboratory outcomes of the Course / Subject are:		
L01	Observe safety precaution in the workshop.	
L02	Use various engineering materials, tools and measuring equipment.	
L03	Practice on manufacturing of components using workshop trades including fitting, carpentry, foundry, black smithy and welding.	
L04	Identify and apply suitable tools for machining processes including turning, facing, thread cutting and tapping.	

Course Name: English		Course Code-100106
The outcomes of the Course / Subject are:		
C01	Ability to communicate effectively and write and present properly.	
C02	Ability to work individually and in intra disciplinary and multidisciplinary teams.	
C03	Recognition of the need for lifelong learning and to access information as well as development in science and technology.	
C04	Knowledge of project management, risk management, innovation and change management, entrepreneurship and sustainable development.	
C05	Ability to identify, define, formulate and solve complex engineering problems as well as electing and applying appropriate analysis and modeling methods for wide purpose.	

Course Name: English		Course Code-100106P
The Laboratory outcomes of the Course / Subject are:		
L01	Identify common errors in spoken and written communication	
L02	Get familiarized with English vocabulary and language proficiency	
L03	Improve nature and style of sensible writing; acquire employment and workplace communication skills.	
L04	Improve their Technical Communication Skills through Technical Reading and Writing practices.	
L05	Perform well in campus recruitment, engineering and all other general competitive examinations	

2nd Semester:-

Course Name: Physics		Course Code- 103201
The outcomes of the Course / Subject are:		
C01	Understand various types of oscillators and their implications.	
C02	Demonstrate different types of oscillations and waves in both electrical and magnetic fields.	
C03	Analyze the intensity variation of light due to polarization, interference and diffraction.	
C04	Understand the different optical phenomenon and apply to real life incidents.	
C05	Study of different types of lasers and its applications are to import knowledge and to develop skills and to use modern instruments in the engineering applications	
C06	Study of material properties and their applications is the prime role to understand and use in engineering applications.	
C07	Explain fundamentals of quantum mechanics and apply to one dimensional motion of particles.	
C08	Classify solids on the basis of band theory.	

Course Name: Physics		Course Code- 103201P
The Laboratory outcomes of the Course / Subject are:		
L01	Estimate the optical properties of light such as interference, diffraction and polarization by different experiments.	
L02	Calculation of the wavelength of LASER using diffraction phenomena.	
L03	Student will understand the characteristics of diode.	
L04	Describe and Demonstrate the behaviour of semiconductor material.	
L05	Students will understand how to find out threshold voltage and calculate Planck's constant using various LEDs.	
L06	How to determine the frequency of alternating current using sonometer and they will be able to relate the tension of the wire, linear density of the wire, and the resonating length of the wire.	

Course Name: Mathematics - II		Course Code-103202
The outcomes of the Course / Subject are:		
C01	Learn about inverse and rank of a matrix and solution of system of equations.	
C02	Analyse symmetric, skew symmetric Matrices and its properties (orthogonal, diagonal Cayley Hamilton theorem).	
C03	Compute bisection method, Newton Raphson method, Regula Falsi, Newton's forward, backward difference,; Gauss's Forward and backward formulae,; Trapezoidal rule, Simpson's 1/3 rd and 3/8 th rule.	
C04	Solve ODEof first and second order by Taylor's series, Euler, Runge kutta methods,; Milne's and Adam's Predictor corrector method and PDE.	
C05	Discuss about Laplace and Fourier transform.	

Course Name: Basic Electrical Engineering		Course Code-100201
The outcomes of the Course / Subject are:		
C01	Examine and execute the basic concepts of AC and DC electric circuit and its behavior.	
C02	Students are capable of analysing the fundamental ideas behind magnetic circuits, including their definition, magnetic hysteresis phenomena, B-H curve, and hysteresis loop.	
C03	Students are capable of applying the essential ideas and definitions of AC circuits, including single-phase, three-phase, RC and RLC circuits, and star and delta connections.	
C04	To identify the different kinds of single-phase transformers and to compute efficiency, losses, and regulations.	
C05	To study the working principles of Electrical Machines.	
C06	To introduce various switches & batteries.	

Course Name: Basic Electrical Engineering		Course Code-100201P
The Laboratory outcomes of the Course / Subject are:		
L01	Get an exposure to basic electrical laws.	
L02	Understand the response of different types of electrical circuits to different excitations.	
L03	Understand the measurement, calculation and relation between the basic electrical parameters.	
L04	Understand the basic characteristics of transformer and electrical machines.	

Course Name: Engineering Graphics & Design		Course Code-100202
The outcomes of the Course / Subject are:		
C01	Apply the concept of drawing in practical applications.	
C02	Draw the projection of points, lines and planes	
C03	Classify solids and projection of solids at different positions	
C04	Show sectioned view of solids and development of surfaces	
C05	Discuss about conics and orthographic views , isometric view of engineering components.	
C06	Understand the basic AUTOCAD commands.	

Course Name: Engineering Graphics & Design		Course Code-100202P
The Laboratory outcomes of the Course / Subject are:		
L01	Get acquainted with the knowledge of various lines, geometrical constructions and construction of various kinds of scales, and Ellipse.	
L02	Improve their imagination skills by gaining knowledge about points, lines and planes.	
L03	Become proficient in drawing the projections of various solids.	
L04	Gain knowledge about orthographic and isometric projections.	
L05	Development of surface of different kind of solid.	
L06	Gain knowledge of basic Auto Cad command and their uses.	

3rd Semester:-

Course Name: OOPS		Course Code-100313
The outcomes of the Course / Subject are:		
C01	Understand the concept of class, object, inheritance and polymorphism	
C02	Apply overload operators in C++	
C03	Understand the difference between function overloading and function overriding	
C04	Incorporate exception handling in object-oriented programs	
C05	Able to use template classes	

Course Name: OOPS		Course Code-100313P
The Laboratory outcomes of the Course / Subject are:		
L01	Understand the concept of class, object, inheritance and polymorphism	
L02	Apply overload operators in C++	
L03	Understand the difference between function overloading and function overriding	
L04	Incorporate exception handling in object-oriented programs	
L05	Able to use template classes	

Course Name: Basic Electronics		Course Code-104301
The outcomes of the Course / Subject are:		
C01	To study basics of semiconductor & devices and their application in different areas.	
C02	To study different biasing techniques to operate transistor, FET, MOSFET and operational amplifier in different modes.	
C03	Analyze output in different operating modes of different semiconductor devices.	
C04	Compare design issues, advantages, disadvantages and limitations of basic electronics.	

Course Name: Basic Electronics		Course Code-1043013P
The Laboratory outcomes of the Course / Subject are:		
L01	To Study about bread board, multi-meter, passive components, function generator and cathode ray oscilloscope.	
L02	To Observe and draw the Forward and Reverse bias V-I Characteristics of a P-N Junction diode & Calculate static and dynamic resistance in both forward and Reverse Bias Condition.	
L03	Input and output Characteristics of a BJT in Common Emitter Configuration are studied.	
L04	Examine the input and output waveforms of Half Wave Rectifier and also calculate its load regulation and ripple factor.	
L05	Examine the input and output waveforms of Full Wave Rectifier and also calculate its load regulation and ripple factor. Observe the output waveforms of inverting and non inverting amplifiers.	

The outcomes of the Course / Subject are:

C01	To understand the atomic structure and bonding in materials & to determine structures of simple crystals by X-ray diffraction, Miller indices of planes and directions, Packing geometry in Metallic, Ionic and Covalent solids, concept of amorphous, Crystal growth techniques.
C02	To know about the Semiconductor, Fermi Dirac Distribution, Hall effect, Intrinsic & Extrinsic, N type & P type, Preparation of electronic grade poly crystal in Siemens reactor, Czochralski method & Float Zonemethod, Mirror finished wafer preparation, Epitaxial film growth–Chemical Vapor phase Deposition.
C03	To understand energy band & E-K diagram, insulators, semiconductors & conductors.
C04	To understand the Magnetic Properties, Para magnetism Diamagnetism, Anti ferromagnetism, Ferromagnetism, Ferri-magnetism, magnetic hysteresis, superconductor & PCB etc.

Course Name: Electrical and Electronic Material		Course Code-104302P
The Laboratory outcomes of the Course / Subject are:		
L01	To determine the structures of simple crystals by X-ray diffraction, Miller indices of planes and directions.	
L02	Familiarization with Insulators, Semiconductors & Conductors, To determine the energy band gap & resistivity with temperature of a semiconductor using four probe methods.	
L03	To determine Hall Voltage, Hall Coefficient, Carrier concentration etc, V-I Characteristics of P-N Junction diode, to determine the energy band gap in a semiconductor using a P-N junction diode.	
L04	To determine the dielectric constant at low frequency & high frequency, Dielectric loss, Piezo-electricity & Ferro-Electricity.	
L05	Familiarization with Para magnetism, Diamagnetism, ferromagnetism material, To know about magnetic hysteresis curve, Electromagnetic Induction, Magnetic field in current carrying coil along with its axis etc.	

Course Name: Mathematics:-III		Course Code-104303
The outcomes of the Course / Subject are:		
C01	Have a discussion about the Chebysev Polynomials and ask different questions.	
C02	Basic concept of Sets, relations and functions: Basic operations on sets, Cartesian product and problem related to Ber and Bei functions; recurrence relations, orthogonality properties.	
C03	Talking about the uses of the Graphs and their basic properties – degree, path, cycle, sub-graph, isomorphism, Eulerian	
C04	Discuss the Measures of Central tendency: Moments, skewness and Kurtosis ; Probability distributions - Binomial, Poisson and Normal ; evaluation of statistical parameters for these three distributions, Correlatio	
C05	Discuss the Curve fitting by the method of least squares fitting of straight lines, second degree parabolas and more general curves. Test of significance: Large sample test for single proportion.	

Course Name: Network Theory		Course Code-104304
The outcomes of the Course / Subject are:		
C01	Students can be able to determine different aspects (i.e. circuit variables and or parameters) of a given network. On the other hand they can be able to find the network if operating characteristics is given.	
C02	They will get familiar with transients and apply the concept in power system for different types of faults. They can model different types of real system.	
C03	They will be familiar with basic idea of passive and active filters and the concept can be extended to develop shunt, series and hybrid filter to compensate harmonics.	

Course Name: Signals & Systems		Course Code-104305
The outcomes of the Course / Subject are:		
C01	Define signal, systems and its importance in life.	
C02	Represent the signal in the time domain as well as in Frequency domain and find the response of the system.	
C03	Explain the transform theory and its importance to analyze signal and system.	
C04	Identify system properties based on impulse response and Fourier analysis.	
C05	Explain Sampling theorem and its importance in discrete time systems representation.	

Course Name: Internship		Course Code-100399
The outcomes of the Course / Subject are:		
C01	Students are typically focuses on practical skill development and real-world application of their academic knowledge.	
C02	It is usually includes goals such as gaining hands-on experience in the field , applying theoretical knowledge to practical situation, improving problem-solving abilities and developing communication and teamwork skill with a professional environment.	
C03	It involves tasks related to design, analysis, implementation and troubleshooting of electronic system or communication devices.	

4th Semester:-

Course Name: Analog Circuit		Course Code-104401
The outcomes of the Course / Subject are:		
C01	Illustrate working principle of different electronic circuit and their application in real life	
C02	Define semiconductor device and different operating condition and their performance parameter.	
C03	Choose proper semiconductor devices depending upon application considering economic and technology up-gradation.	
C04	Employ mathematical and graphical analysis considering different practical issues modeling of semiconductor device; analyze the performance parameter of the system.	
C05	Recognize different signal processing circuit and the use in industrial, real life, modern control system application.	
C06	Use modeling/simulation parameters with standard equivalent circuit models to predict correctly the expected performance of various general-purpose electronic circuits.	

Course Name: Analog Circuit		Course Code-104401P
The Laboratory outcomes of the Course / Subject are:		
L01	It gives easy algorithms to solve many complex technical Computing problems.	
L02	To calculate the h parameters of CE Configuration & to assign the bipolar junction transistor using common amplifier	
L03	To design RC Coupled single stage BJT amplifier & to design Darlington amplifier using bipolar junction transistor	
L04	To plot V-I characteristics of a Transistor connected in CE configuration and Calculate the value of β , Input and Output Resistance.	
L05	To plot V-I characteristics of a Transistor connected in CB configuration and Calculate the value of α , Input and Output Resistance.	

Course Name: Analog Communication		Course Code-104402
The outcomes of the Course / Subject are:		
C01	Knowledge to analyze energy and power spectral density of the signal.	
C02	Develop an understanding of the performance of analog communication systems.	
C03	Calculate bandwidth and power requirements for analog systems. Analyze the different characteristics of the receiver.	
C04	Evaluate the performance of the communication system in the presence of noise.	

The Laboratory outcomes of the Course / Subject are:

L01	It gives easy algorithms to solve many complex technical Computing problem.
L02	To generate amplitude modulated wave and determine the percentage modulation & To Demodulate the modulated wave using envelope detector
L03	This detector provides a technique to how to observe the Characteristics of Diode
L04	To generate frequency modulated signal and determine the modulation index and bandwidth for various values of amplitude and frequency of modulating signal & To demodulate a Frequency Modulated signal using FM detector.
L05	To generate the Pulse Amplitude modulated and demodulated signals & PAM is of two types: 1. Double polarity PAM □□this is the PAM wave of only either negative (or) Positive pulses. In this the fixed dc level is added to the signal to ensure single polarity signal.
L06	To generate AM-Double Side Band Suppressed Carrier (DSB-SC) signal & To Observe the effect of Pre-emphasis on given input signal & To observe the effects of De-emphasis on given input signal.

Course Name: Digital Circuits		Course Code-104403
The outcomes of the Course / Subject are:		
C01	Convert different type of codes and number systems which are used in digital communication and computer systems.	
C02	Employ the codes and number systems converting circuits and compare different types of logic families which are the basic unit of different types of logic gates in the domain of economy, performance and efficiency.	
C03	Analyze different types of digital electronic circuit using various mapping and logical tools and know the techniques to prepare the most simplified circuit using various mapping and mathematical methods.	
C04	Design different types of with and without memory element digital electronic circuits for particular operation, within the realm of economic, performance, efficiency, user friendly and environmental constraints	

Course Name: Digital Circuits		Course Code-104403P
The Laboratory outcomes of the Course / Subject are:		
L01	To learn basic techniques for the design of digital circuits and fundamental concepts used in the design of digital systems.	
L02	To understand common forms of number representation in digital electronic circuits and to be able to convert between different representations	
L03	To implement simple logical operations using combinational logic circuits	
L04	To design combinational logic circuits, sequential logic circuits	
L05	To design sequential circuits, enabling them to analyze sequential systems in terms of state machines	
L06	To implement synchronous state machines using flip-flops.	

Course Name: Semiconductor physics and Devices		Course Code-104405
The outcomes of the Course / Subject are:		
C01	Describe and illustrate the Atoms, Electrons, Energy Bands and Charge carriers in semiconductor.	
C02	Sketch and explain the Carrier Transport Phenomena in semiconductor.	
C03	Illustrate with the sketch of the structure of PN Junction and Junction Diodes diagram their characteristics and analyze them.	
C04	Appraise the principle of operation BJTs, schematize their characteristics, assess and summarize their features.	
C05	Schematize the structure and design Field Effect Transistors. Schematize their Characteristics and prepare an inference.	

Course Name: Semiconductor physics and Devices		Course Code-104405P
The Laboratory outcomes of the Course / Subject are:		
L01	Draw the Forward and Reverse bias V-I Characteristics of a PN Junction diode and calculate its static and dynamic resistance.	
L02	Draw the static characteristics of a zener Diode.	
L03	Design Zener Diode as voltage regulator.	
L04	Draw input and output characteristics of a transistor connected in CE configuration.	
L05	Draw the output and transfer characteristics of a given JFET.	
L06	Draw V-I characteristics of LED.	

Course Name: Electromagnetic Theory		Course Code-104404
The outcomes of the Course / Subject are:		
C01	To understand and solve boundary value problems, such as finding electric and magnetic fields at the interface between different materials.	
C02	Students should be able to calculate electric and magnetic fields in different scenarios, including point charges, current carrying wires and complex charge distribution	
C03	To Understand the propagation of electromagnetic waves, including their properties, behaviors and equations and apply this knowledge to various wave scenarios.	

5th Semester:-

Course Name: Computer Network and Security		Course Code-104501
The outcomes of the Course / Subject are:		
C01	Explain the functions of the different layers of OSI protocol.	
C02	Draw the functional block diagram of wide area network(WAN),local area network(LANs) and wireless LANs(WLANs) and can be able to describe the function of each block	
C03	Program for a given problem related TCP/IP protocol.	
C04	Configures DNS, DDNS, TELNET, EMAIL ,FTP, WWW ,HTTP, Bluetooth ,Firewalls using open source available software and tools	

Course Name: Digital Signal Processing		Course Code-104502
The outcomes of the Course / Subject are:		
C01	State sampling theorem and reproduce a discrete-time signal from an analog signal;	
C02	Classify systems based on linearity, causality, shift-variance, stability criteria and represent transfer function of the selected system;	
C03	Evaluate system response of the system using convolution methods, frequency transformation technique, DFT, DIF-FFT or DIT-FFT algorithm, window techniques;	

Course Name: Digital Signal Processing		Course Code-104502P
The Laboratory outcomes of the Course / Subject are:		
L01	Demonstrate understanding of MATLAB with signal processing perspective.	
L02	Design digital system and analyse its characteristics in transform domain.	
L03	Design and implement FIR and IIR filters.	
L04	Apply the knowledge of MATLAB to various set of signal processing problems.	
L05	Develop and apply the signal Processing Algorithms in various applications.	

Course Name: Linear Control System

Course Code-104503

The outcomes of the Course / Subject are:

C01	Model the linear system and study the control system component specification through classical approach
C02	Understand the time response specification and its control
C03	Analyze the absolute and relative stability
C04	Understand Frequency response tools like bode plot and Nyquist plot.
C05	Understand the introductory concept of state variable approach.
C06	Understand the introductory concept of state variable approach.

Course Name: Linear Integrated Circuits and Applications

Course Code-104504

The outcomes of the Course / Subject are:

C01	Learn about the basic concepts for the circuit configuration for the design of linear integrated circuits and develops skill to solve engineering problems.
C02	Develop skills to design simple circuits using OP-AMP.
C03	Gain knowledge about various multiplier circuits, modulators and demodulators.
C04	Gain knowledge about PLL.
C05	Learn about various techniques to develop A/D and D/A convertors. Develop skills to develop simple filter circuits and various amplifiers and can solve problems related to it.

Course Name: Linear Integrated Circuits and Applications

Course Code-104504P

The Laboratory outcomes of the Course / Subject are:

L01	Learn about the basic concepts for the circuit configuration for the design of linear integrated circuits and develops skill to solve engineering problems.
L02	Develop skills to design simple circuits using OP-AMP.
L03	Gain knowledge about various multiplier circuits, modulators and demodulators.
L04	Gain knowledge about PLL.
L05	Learn about various techniques to develop A/D and D/A convertors. Develop skills to develop simple filter circuits and various amplifiers and can solve problems related to it.

Course Name: Microprocessors and Microcontrollers

Course Code-104505

The outcomes of the Course / Subject are:

C01	Understand the fundamentals of microprocessors
C02	To study detailed hardware and software architecture of microcontroller.
C03	Understand the instruction set of microprocessors and do assembly language programming.
C04	Study the interfacing designs of peripherals like I/O ,A/D,D/A and timers etc
C05	Develop various systems with the help of microprocessors and microcontrollers.

Course Name: Microprocessors and Microcontrollers		Course Code-104505P
The Laboratory outcomes of the Course / Subject are:		
L01	Understand and apply the fundamentals of assembly level programming of microprocessors.	
L02	Work with standard microprocessor real time interfaces including serial ports, digital-to-analog converters, and analog-to-digital converters.	
L03	Analyze abstract problems and apply a combination of hardware and software to solve problem.	
L04	Use standard test and measurement equipment to evaluate digital interfaces.	

Course Name: Probability Theory and stochastic Process		Course Code-104506
The outcomes of the Course / Subject are:		
C01	Learn about the sets, probability spaces, conditional and independent probabilities; Poisson approximation; Bernoulli trials their expectations and moments.	
C02	Study about the Normal, Exponential continuous distribution and their properties.	
C03	Analyse Bivariate distributions and their properties,; Markov, Chebyshev and Chernoff bounds.	
C04	Describe random sequences, Limit and Central Limit theorems.	
C05	Discuss random, stationary process, Ergodicity and Markov chain Processes.	

Course Name: Summer Entrepreneurship-II

Course Code-100510

The outcomes of the Course / Subject are:

C01	It aims to cultivate entrepreneurial skills within the context of electronics and communication.
C02	It could involve fostering an understanding of business models, market analysis, and feasibility studies specifically within the tech industry.
C03	The goals might include developing skills in ideation, prototyping, and business planning, and understanding the essentials of technology commercialization.
C04	Furthermore, students might learn about intellectual property rights, pitching, and the process of bringing electronic and communication innovations to the market.

6th Semester:-

Course Name: Biology For Engineers		Course Code-100601
The outcomes of the Course / Subject are:		
C01	Describe how biological observations of 18th Century that lead to major discoveries.	
C02	Convey that classification per se is not what biology is all about but highlight the underlying criteria, such as morphological, biochemical and ecological	
C03	Highlight the concepts of recessiveness and dominance during the passage of genetic material from parent to offspring	
C04	Convey that all forms of life have the same building blocks and yet the manifestations are as diverse as one can imagine	
C05	Classify enzymes and distinguish between different mechanisms of enzyme action	
C06	Identify DNA as a genetic material in the molecular basis of information transfer.	
C07	Analyze biological processes at the reductionist level	
C08	Apply thermodynamic principles to biological systems & Identify and classify microorganisms.	

Course Name: Computer Organization and Architecture		Course Code-104601
The outcomes of the Course / Subject are:		
C01	Understand the basics of instructions sets and their impact on processor design	
C02	Demonstrate an understanding of the design of the functional units of a digital computer system.	
C03	Evaluate cost performance and design trade-offs in designing and constructing a computer processor including memory	
C04	Design a pipeline for consistent execution of instructions with minimum hazards	
C05	Manipulate representations of numbers stored in digital computers	

Course Name: Digital Communication		Course Code-104602
The outcomes of the Course / Subject are:		
C01	Demonstrate the concept of sampling, Quantization and various waveform-coding schemes.	
C02	Apply the concepts of various baseband transmission schemes.	
C03	Design and develop the different digital modulation systems.	
C04	Apply the concepts of information theory for digital communication systems.	
C05	Apply the concepts of spread spectrum techniques for digital communication Systems.	

Course Name: Digital Communication		Course Code-104602P
The Laboratory outcomes of the Course / Subject are:		
L01	Analyze the signal sampling, quantization and its reconstruction.	
L02	Design the modulators and demodulators for various digital modulation techniques such as ASK, PSK, FSK, QPSK, and QAM	
L03	Design system for Time Division multiplexing Technique.	
L04	Design system for Frequency Division multiplexing Technique.	
L05	Perform the simulation of DPSK using Matlab.	
L06	Obtain a Direct Sequence Spread Spectrum for a given input signal by simulating in MATLAB.	

Course Name: Electronics Instrumentation and Measurement		Course Code-104604
The outcomes of the Course / Subject are:		
C01	Have a thorough understanding of the fundamental concepts of intelligent instruments and its characteristics.	
C02	To design the basic circuits using op-amp and perform operations and their troubleshooting.	
C03	To Understand the basic building blocks of smart sensor and interfacing devices.	
C04	To understand and analyze basic building blocks of different types A/D and D/A converters & To understand the basics of memory and timer circuits.	

The Laboratory outcomes of the Course / Subject are:

L01	To learn the standards of Measurement, Errors and their evaluation, Calibration by different measuring instruments.
L02	To learn the process of measuring the voltage, current, power and energy with the help of different measuring tools, Use of Dynamometer and moving iron factormeters, moving coil and moving iron frequency meters. To know about voltmeter, ammeter, Wattmeter and Energy meter, Voltmeter multipliers, Ammeter shunt, Current and Potential Transformers.
L03	To understand the measuring process of magnetic flux by flux meter, Determination of B-H curve and hysteresis loop, Measurement of iron loss.
L04	To learn how to do Digital measurements by digital voltmeter and multi meter, Universal counter, ratio of two frequencies, Time period and Pulse width.

The outcomes of the Course / Subject are:

C01	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
C02	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
C03	Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
C04	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering
C05	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
C06	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
C07	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

7th Semester:-

Course Name: Antenna & Wave Propagation		Course Code-100710
The outcomes of the Course / Subject are:		
C01	Understand and differentiate between various antenna types, such as Dipole antenna, patch antenna, YAGI antennas, and their specific application.	
C02	Ability to analyze and predict radiation pattern of different antenna, including directional, Omni-directional and sector- specific patterns.	
C03	Proficiency in designing antennas for specific frequency range and applications, considering factors like Impedance matching and radiation efficiency.	
C04	Knowledge of transmission line theory and the ability to design and implement impedance matching networks for antenna.	
C05	Skill in using software tools for simulating antenna performance and predicting how antenna will behave in various scenarios.	

Course Name: Business Analytics		Course Code-104701
The outcomes of the Course / Subject are:		
C01	Identify appropriate data analytic techniques to address business problems.	
C02	Apply data analytic techniques to solve problems in a variety of business contexts.	
C03	Integrate the knowledge and skills acquired to conduct research in an industry setting.	
C04	Deal with ambiguity and uncertainty,	
C05	Communicate the results of technical analysis to non-technical audiences.	
C06	Work effectively in teams.	

Course Name: Cost Management of Engineering Projects		Course Code-104702
The outcomes of the Course / Subject are:		
C01	Understand basic concepts of Cost Accounting.	
C02	Apply concepts of cost in project management Apply	
C03	Analyze cost behavior for decision making Analyze	
C04	Construct different budgets for controlling the cost	

Course Name: Wireless Communication		Course Code-104703
The outcomes of the Course / Subject are:		
C01	Ability to understand and analyze Fading, Cordless telephone system.	
C02	Ability to suggest a Digital Signal modulation for a given application.	
C03	Ability to operate various Multiple access system	
C04	Ability to acquire knowledge on various wireless communications network, GPRS, Wireless LAN'S	
C05	Ability to understand basics of Diversity	

Course Name: High Speed Electronics		Course Code-104708
The outcomes of the Course / Subject are:		
C01	This course would enable the student to critically analyze a Electronics device in terms of designers' perspective.	
C02	The performance of individual Devices frontend modules translates into metrics like JFET, MOSFET and CMOS parameters.	
C03	With the knowledge imparted in this course the students would be able to understand the significance.	
C04	The project involved would make the student confident about implementation and bring him in terms with factual reality.	

Course Name: Summer Entrepreneurship-III		Course Code-100702
The outcomes of the Course / Subject are:		
C01	The focus might shift toward advanced business and leadership skills within the realm of electronics and communication.	
C02	It could include honing strategic planning abilities, understanding venture capital, and mastering the intricacies of scaling tech-based enterprises.	
C03	Students might delve deeper into innovation management, exploring international markets, and learning to navigate regulatory and compliance challenges specific to technology businesses.	
C04	Additionally, fostering a strong foundation in ethical and socially responsible entrepreneurship within the tech sector might be a part of the outcomes.	

Course Name: Project-I		Course Code-100709
The outcomes of the Course / Subject are:		
C01	In Project-I students typically include developing skills in project management, research, problem-solving, and applying theoretical knowledge to practical scenarios.	
C02	It involves enhancing abilities in critical thinking, innovation, technical presentation, and documentation.	
C03	The outcomes might also focus on fostering teamwork, communication, and a deep understanding of the chosen project's domain.	

8th Semester:-

Course Name: Microwave Theory and Techniques		Course Code- 100806
The outcomes of the Course / Subject are:		
C01	Demonstrate a solid understanding of fundamental microwave concepts, including electromagnetic wave behavior in microwave spectrum and the significance of microwave frequencies.	
C02	Gain expertise in the operation and practical application of key microwave components like waveguides, resonators & microwave tubes.	
C03	Develop the ability to analyze and design microwave networks, including transmission lines, waveguides and matching networks.	
C04	Design microwave circuit such as amplifiers, oscillators and mixers while considering stability, gain and noise figure.	
C05	Model and simulate microwave devices and circuits using appropriate software tools.	

Course Name: Internet of Things		Course Code- 100814
The outcomes of the Course / Subject are:		
C01	To understand the basics of IoT Networking	
C02	To learn working of IoT Connectivity/Medium access protocols	
C03	To understand about IoT network layer/communication protocols	
C04	To Analyze various IoT Application layer Protocols	

Course Name: Wireless Sensor Networks		Course Code- 104804
The outcomes of the Course / Subject are:		
C01	Identify different issues in wireless ad hoc and sensor networks.	
C02	To analyze protocols developed for ad hoc and sensor networks.	
C03	To identify and address the security threats in ad hoc and sensor networks.	
C04	Establish a Sensor network environment for different type of applications.	
C05	To analyze sensor network for latest maritime applications.	

Course Name: Transducers and Sensors		Course Code- 104812
The outcomes of the Course / Subject are:		
C01	Use concepts in common methods for converting a physical parameter into an electrical quantity	
C02	Classify and explain with examples of transducers, including those for measurement of temperature, strain, motion, position and light	
C03	Choose proper sensor comparing different standards and guidelines to make sensitive measurements of physical parameters like pressure, flow, acceleration, etc	
C04	Predict correctly the expected performance of various sensors	
C05	Locate different type of sensors used in real life applications and paraphrase their importance	
C06	Set up testing strategies to evaluate performance characteristics of different types of sensors and transducers and develop professional skills in acquiring and applying the knowledge outside the classroom through design of a real-life instrumentation system.	

Course Name: Project-II		Course Code-100801
The outcomes of the Course / Subject are:		
C01	The course outcomes for a major project, students often revolve around advanced applications of technical skills, in-depth research, and the ability to handle complex problems independently.	
C02	It emphasizes the development of a comprehensive understanding of project design, execution, and evaluation.	
C03	Students are expected to demonstrate mastery in project planning, analysis, and implementation, as well as effective communication, critical thinking, and possibly innovation in the chosen area of study.	