B.TECH – ELECTRONICS & COMMUNICATION ENGINEERING

Department Vision

Envision a diverse and stimulating academic research ambience for student community and shaping them into competent professionals in the field of Electronics and Communication Engineering and to cater to the needs of society with a keen sense of environmental consciousness.

Department Mission

1. To Educate the students with the state-of-the-art technologies in Electronics and Communication Engineering to meet the ever-growing challenges of the industry.

2. To Nurture the spirit of innovation and creativity in the faculty and students in order for them to carry out research in collaboration with research organizations and industry.

3. To Provide ethical and value-based education that promotes activities pertaining to societal needs.

Program Educational Objectives (PEOs):

PEO1	Preparing our graduates for successful careers in design, installation, operation andmaintenance of electronic systems and processes.
PEO2	Preparing our graduates to have the ability for lifelong learning by pursuing higher education, research and professional development
PEO3	Preparing our graduates to attain leadership roles in industry, academia and research organizations and innovate continuously.
PEO4	Preparing our graduates to develop management skills and become entrepreneurs.
PEO5	Preparing our graduates as ethical, responsible and value based professionals who workcontinuously for the benefit of the society.

Program Specific Outcomes (PSO's):

PSO1:	Should be able to clearly understand the concepts and applications in the field of networking, Communication systems and VLSI.
PSO2:	Should be able to associate the learning from courses, Embedded Systems and IoT in arriving solutions to real world problems.

Program Outcomes (POs):

Engineering Graduates will be able to:

1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first Principles of mathematics, natural sciences, and engineering sciences.
3	**Design/development of solutions:** 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.
4	**Conduct investigations of complex problems:** 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.
5	**Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6	**The engineer and society:** 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.
7	**Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustain able development.
8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11	**Project management and finance:** Demonstrate knowledge and understandingoftheengineeringandmanagementprinciplesandapplythese to one's own work, as a member and leader in a team, to manage projects and in multi-disciplinary environments.
12	**Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course outcomes (Cos) of all courses of all programs offered by the institution

Course Outcomes for First Year First Semester Course	
Course Code: B20 HS 1101	
Course Title: ENGLISH	
CO-1	Identify the context, topic and pieces of specific information by understanding and responding to the social or transactional dialogues spoken by native speakers of English.
CO-2	Apply suitable strategies for skimming and scanning to get the main idea of a text and locate specific information.
CO-3	Build confidence and adapt themselves to the social and public discourses, discussions and presentations.
CO-4	Apply the principles of writing to paragraphs, arguments, essays and formal/informal communication.
CO-5	Construct sentences using proper grammatical structures and correct word forms.
Course Code: B20BS1101	
Course Title: MATHEMATICS – I	
CO-1	Solve a given system of linear algebraic equations
CO-2	Determine Eigen values and Eigen vectors of a system represented by a matrix.
CO-3	Solve ordinary differential equations of first order and first degree.
CO-4	Apply the knowledge in simple applications such as Newton's law of cooling, orthogonal trajectories and simple electrical circuits
CO-5	Solve linear ordinary differential equations of second order and higher order.
CO-6	Determine Laplace transform, inverse Laplace transform and solve linear ODE
Course Code: B20BS1103	
Course Title: APPLIED CHEMISTRY	
CO-1	Develop polymer composites, synthetic polymers and formulation of polymers and their use in design
CO-2	Apply the knowledge about quality of water and its treatment methods for domestic and industrial applications. Understanding the principle, mechanism of corrosion and utilization of various techniques to control.
CO-3	Develop the knowledge of fuels and their economics, advantages and limitations.Make use of the basic concepts of semiconductors and liquid crystals for engineering applications.
CO-4	Identify constituents of various ceramic materials, characteristics and their appropriate use in construction. Apply the knowledge of electrochemistry principles to design energy storage
Course Code: B20CS1101	
Course Title: PROGRAMMING FOR PROBLEM SOLVING USING C	
CO-1	Apply Precedence and Associativity rules to evaluate Expressions.
CO-2	Make use of Decision Making and Looping statements to solve various problems in C
CO-3	Illustrate the importance of Arrays and Strings and to apply various operations on them.
CO-4	Solve various problems by making use of Structure and Union concepts
CO-5	Design and implement programs to analyze the different pointer applications
CO-6	Develop programs using Functions and Pointers.
Course Code: B20EC1101	
Course Title: BASIC ELECTRONICS	
CO-1	Describe the concepts of circuit theory and measuring instruments.

CO-2	Explain the basic concepts of semiconductors, drift and diffusion current densities.
CO-3	Interpret the structure and operation of various diodes and rectifier circuits.
CO-4	Illustrate the characteristics of BJT, FET along with the fabrication process of Monolithic IC.
CO-5	Relate the concepts of number systems, logic gates and flip flops.
Course Code: **B20CS1103**	
Course Title: PROGRAMMING FOR PROBLEM SOLVING USING C LAB	
CO-1	Write, Trace and Debug the programs and correct syntax and logical errors.
CO-2	Solve various Problems by making use of Arrays, Strings, Structures, Unions andPointers
CO-3	Solve a complex problem by decomposing into several modules by using Functions
CO-4	Apply various File I/O operations
Course Code: B20BS1108	
Course Title: APPLIED CHEMISTRY LAB	
CO-1	Gain technical knowledge of measuring, operating and testing of chemical instruments and equipment s. Carrying out different types of chemical reactions for analyzingdifferent materials in micro level quantities.
CO-2	Analyze and generate experimental skills to enhance the analytical thinking capabilities in the modern trends in engineering and technology.
Course Code: B20EC1102	
Course Title: ELECTRONICS WORKSHOP	
CO-1	Identify electronic components like resistors, capacitors, diodes, transistors etc.
CO-2	Use measuring instruments and equipment such as multimeter, function generator,power supply and CRO. Assemble circuits on a breadboard, analyze the performance of the circuits, evaluate the results and confirm the validity of established concepts.
CO-3	Describe the PCB fabrication process, Solder and de-solder components on PCB.
CO-4	Use EDA/System tools such as PSPICE and MATLAB
CO-5	Examine the PC Hardware,Software and Arduino/Raspberry Pi boards

Course Outcomes for First Year Second Semester Course	
Course Code: B20BS1201	
Course Title: MATHEMATICS – II	
CO-1	Determine Fourier series and half range series of functions
CO-2	Determine Fourier transforms of non-periodic functions and also use them to evaluate integrals.
CO-3	Compute partial derivatives, total derivative and Jacobians.
CO-4	Find maxima/minima of functions of two variables and evaluate some real definite integrals.
CO-5	Form partial differential equations and solve Lagrange linear equation. Solve linear higher order homogeneous and non-homogeneous PDEs.
CO-6	Find theoretical solution of one-dimensional wave equation and one-dimensional heat equation

Course Code: B20BS1202	
Course Title: APPLIED PHYSICS	
CO-1	Interpret the behavior of light radiation in interference and diffraction Phenomena and their applications.
CO-2	Explain the classification and properties of dielectric and magnetic materials suitable for engineering applications.
CO-3	Understand the basics of modern optical technologies like lasers and optical fibers and their utility in various fields.
CO-4	Explain the important aspects of semiconductors and electrical conductivity in them.
CO-5	Understand the basics of technology of Ultrasonic in various fields and demonstrate the synthesis and applications of nano-materials.
Course Code: B20EE1201	
Course Title: BASIC ELECTRICAL ENGINEERING	
CO-1	Explain the principle of operation of DC machines and analyze their characteristics. Acquire the skills to analyze the speed control methods of DC motors.
CO-2	Analyze single-phase AC circuits consisting of series RL - RC - RLC combinations.
CO-3	Explain the operation of single-phase transformer.
CO-4	Analyze the slip – torque characteristics of a 3-phase induction motor.
CO-5	Explain the operation of synchronous generators.
Course Code: B20ME1203	
Course Title: ENGINEERING DRAWING	
CO-1	Apply principles of drawing to Construct polygons and engineering curves.
CO-2	Apply principles of Orthographic projections to draw the projections of points and lines.
CO-3	Apply principles of drawing to draw the projections of planes.
CO-4	Apply principles of drawing to draw projections of solids and their sectional views.
CO-5	Apply principles of drawing to draw developments and pictorial view of solids.
Course Code: B20EE1202	
Course Title: NETWORK ANALYSIS	
CO-1	Apply concepts of Kirchhoff's laws, Network reduction Techniques for solving DC circuits and apply various network theorems to analyze the various electric circuits.
CO-2	Learn the behavior of energy storage elements (inductance and capacitance) in electric circuits and analyze transient and steady state response.
CO-3	Analyze the RLC circuits in sinusoidal steady state.
CO-4	Determine two port network parameters.
CO-5	Determine network function, poles-zeros and stability of network function.
Course Code: **B20BS1207**	
Course Title: APPLIED PHYSICS LAB	
CO-1	Get hands on experience in setting up experiments and using the instruments / equipment individually.
CO-2	Get introduced to using new / advanced technologies and understand their significance.

Course Code: B20HS1202	
Course Title: COMMUNICATION SKILLS LAB	
CO-1	Apply their linguistic competence in all LSRW skills to professional and personalsettings.
CO-2	Apply communication skills learn through various language learning activities to their advancement in academics and competitive examinations.
CO-3	Draft job application letters, E-Mail messages and other writing discourses.
CO-4	Adopt professional etiquette consistent with formal settings.
CO-5	Improve fluency and clarity in both spoken and written English.
Course Code: B20EE1204	
Course Title: BASIC ELECTRICAL ENGINEERING LAB	
CO-1	Verify ohms law and Kirchhoff's laws for a given circuit
CO-2	Determine the parameters of iron core inductor
CO-3	Predetermine the performance of DC machines and transformers.
CO-4	Make use of DC shunt machines for applications.
CO-5	Perform brake test on 3-phase induction motor.
Course Code: B20MC1202	
Course Title: PROFESSIONAL ETHICS AND HUMAN VALUES	
CO-1	Identify and analyze an ethical issue in the subject matter under investigation orin a relevant field. Demonstrate knowledge of ethical values in non-classroom activities, such as service learning, internships and field work.
CO-2	Identifythemultipleethicalinterestsatstakeinareal-worldsituationorpractice and Articulate what makesaparticularcourseofactionethicallydefensible.
CO-3	Assess their own ethical values and the social context of problems.
CO-4	Identify ethical concerns in research and intellectual contexts, including academic integrity,use and citation of sources, the objective presentation of data, and the treatment of human subjects.
CO-5	Integrate, synthesize, and apply knowledge of ethical dilemmas and resolutions in academic settings, including focused and interdisciplinary research.
Course Code: B20MC1203	
Course Title: NATIONAL SERVICE SCHEME(NSS)	
CO-1	Understand general orientation about community service, voluntarism role and responsibility of NSS volunteer.
CO-2	Analyze about the community he live in.
CO-3	Asses the life in adopted villages.
CO-4	Identify the importance of national days and attain participation in it.

Course Outcomes for Second Year First Semester Course	
Course Code: B20BS2102	
Course Title: NUMERICAL METHODS AND ADVANCED CALCULUS	
CO-1	Find a real root of algebraic and transcendental equations. Fit an interpolation formula and perform interpolation for equally spaced and unequally spaced data.
CO-2	Evaluate numerically certain definite integrals and solve a first order ordinary differential equation by Euler and RK methods.
CO-3	Evaluate double integrals and determine the areas.
CO-4	Evaluate triple integrals and determine the volumes.
CO-5	Find the gradient of a scalar function, divergence and curl of a vector function. Solve simple problems using vector integral theorems.
CO-6	Comprehend the concept of Analytic function and apply in Electrostatics and Fluid dynamics
Course Code: B20EC2101	
Course Title: ELECTRONIC DEVICES AND CIRCUITS	
CO-1	Analyze the characteristics and operation of Diode, BJT.
CO-2	Deduce the stability factors of different biasing circuits of BJT.
CO-3	Analyze the characteristics and operation of JFET and MOSFET.
CO-4	Design the small signal BJT single stage amplifiers.
Course Code: B20EC2102	
Course Title: DIGITAL LOGIC DESIGN	
CO-1	Convert one number system to another, analyze logic gates and Boolean theorems.
CO-2	Analyze digital circuits using different minimization techniques.
CO-3	Design various combinational and sequential circuits along with applications.
CO-4	Design counters and state machines by applying the knowledge of synchronous and asynchronous sequential circuits.
Course Code: B20EC2103	
Course Title: **SIGNALS AND SYSTEMS**	
CO-1	Outline the basic concepts of signals and systems.
CO-2	Analyze the spectral characteristics of Continuous Time and Discrete Time periodic and a periodic signals using Fourier analysis.
CO-3	Analyze system properties based on impulse response and Fourier analysis.
CO-4	Apply Laplace- transforms for analyzing Continuous -time signals and systems.
CO-5	Apply Z- transforms for analyzing discrete-time signals and systems.
CO-6	Outline the process of sampling and the effects of under sampling.
Course Code: B20EC2104	
Course Title: RANDOM VARIABLES AND STOCHASTIC PROCESSES	
CO-1	Demonstrate the axiomatic formulation of modern probability theory.
CO-2	Characterize Probability Models and functions of Random variables based on single and multiple random variables.
CO-3	Evaluate and apply moments and characteristic functions and acquire the concept of Inequalities and probabilistic limits.
CO-4	Assimilate the concept of Random process and determine covariance and spectral density of stationary random processes.
CO-5	Identify specific applications to Poisson and Gaussian processes, and Analyze the response of random inputs to linear time invariant systems.

Course Code: **B20EC2105**	
Course Title: ELECTRONIC DEVICES AND CIRCUITS LAB WITH SIMULATION	
CO-1	Apply the concepts of different electronic devices to verify their characteristics and measure the important parameters.
CO-2	Analyze the performance of rectifier circuits with and without filters.
CO-3	Analyze the performance of BJT and FET amplifier circuits.
CO-4	Simulation and Design of small electronic circuits using BJT and FET.
Course Code: B20EC2106	
Course Title: DIGITAL LOGIC DESIGN LAB	
CO-1	Analyze and design basic combinational logic circuits using Digital IC' and HDL programming.
CO-2	Implement basic sequential logic circuits using Digital IC's and HDL programming.
Course Code: B20EC2107	
Course Title: SIGNALS AND SYSTEMS LAB	
CO-1	Construct various CT & DT signals and can perform basic operation on these signals using MAT LAB.
CO-2	Analyse the spectral characteristics of continuous-time and discrete- time, periodic and aperiodic signals using Fourier analysis.
CO-3	Analyse system properties based on impulse response and Fourier analysis
CO-4	Classify systems based on their properties and determine the response ofLSI system using convolution
CO-5	Examine the process of sampling and the effects of under sampling.
Course Code: B20EC2108	
Course Title: ARDIUNO PROGRAMMING	
CO-1	Learn the basics of electronics, including reading schematics (electronics diagrams)
CO-2	Learn how to interface sensors with Arduino.
CO-3	Analyze the Arduino Examples along with programming language and IDE.
CO-4	Design Prototype circuits related to real world applications.
Course Code: B20MC2101	
Course Title: ENVIRONMENTAL SCIENCE	
Course Code: B20MC2103	
Course Title: ENGLISH PROFICIENCY	
CO-1	Improve speaking skills.
CO-2	Enhance their listening capabilities
CO-3	Learn and practice the skills of composition writing.
CO-4	Enhance their reading and understanding of different texts.
CO-5	Improve their communication both in formal and informal contexts.
CO-6	Be confident in presentation skills.

Course Outcomes for Second Year Second Semester Course	
Course Code: B20EC2201	
Course Title: ELECTRONIC CIRCUIT ANALYSIS AND DESIGN	
CO-1	Outline the concepts of multistage amplifiers, feedback amplifiers, power amplifiers, tuned amplifiers, operational amplifiers and oscillators.
CO-2	Apply the concepts in the realization of practical circuits.
CO-3	Analyze and design practical electronic circuits using amplifiers, oscillators and operational amplifiers.
Course Code: B20EC2202	
Course Title: LINEAR AND DIGITAL IC APPLICATIONS	
CO-1	Design/analyze fundamental circuits based on op-amps
CO-2	Design and analyze of various active filters, oscillators
CO-3	Design and Analyze of various applications using IC 555 timer
CO-4	Analyze the designing of Analog to digital and Digital to Analog converters
CO-5	Analyze the various Digital IC Logic Families and to implement the logic function
Course Code: B20EC2203	
Course Title: ANALOG COMMUNICATIONS	
CO-1	Analyze the concepts of Amplitude modulation and demodulation techniques.
CO-2	Analyze the concepts of DSB-SC,SSB,VSB modulation and demodulation techniques.
CO-3	Analyze the concepts of angle modulation and demodulation techniques.
CO-4	Identify the functional blocks of transmitters and receivers
CO-5	Compare the performance of analog modulation techniques in the presence of noise and differentiate various Pulse modulation and demodulation techniques.

Course Code: B20EC2204	
Course Title: COMPUTER ARCHITECTURE AND ORGANIZATION	
CO-1	Analyze how computers represent and manipulates data
CO-2	Develop the general architecture design of a digital computer
CO-3	Acquiring the knowledge of designing micro programs for few basic instructions
CO-4	Develop independent learning skills to interface main memory & I/O
Course Code: B20EC2205	
Course Title: ELECTROMAGNETIC FIELD THEORY AND TRANSMISSION LINES	
CO-1	Illustrate the behaviour of static electric and magnetic fields in different media for different charge and current distributions.
CO-2	Apply Maxwell's equations to describe the behaviour of time varying electromagnetic fields.
CO-3	Apply Maxwell's equations to describe the EM wave propagation in a homogeneous medium.
CO-4	Compute different transmission line parameters.
Course Code: **B20EC2206**	
Course Title:ELECTRONIC CIRCUIT ANALYSIS AND DESIGN LAB WITH SIMULATION	
CO-1	Apply the concepts of amplifier analysis to verify their characteristics and measure the important parameters.
CO-2	Analyze the performance of power amplifiers.
CO-3	Analyze the frequency response and characteristics of operational amplifiers.
CO-4	Simulation and Design of different amplifiers and oscillator circuits.
Course Code: B20EC2207	
Course Title: LINEAR AND DIGITAL IC APPLICATIONS LAB WITH SIMULATION	
CO-1	Students will have a thorough understanding of operational amplifier (741)
CO-2	Students will be able to design circuits using operational amplifiers for various applications
CO-3	Know the differences between Linear and Digital Integrated IC's
CO-4	Students will demonstrate their knowledge by designing analog circuits & digital circuits.
Course Code: B20EC2208	
Course Title: ANALOG COMMUNICATIONS - LAB WITH SIMULATION	
CO-1	Design and implement modulation and demodulation circuits for amplitude modulation and frequency modulation techniques.
CO-2	Design second order active filters for various frequency bands.
CO-3	Construct the circuit and study the characteristics of different transmitter and receiver circuits such as Harmonic generator, RF Amplifier, pre-emphasis and de-emphasis

Course Code: B20EC2209	
Course Title: PYTHON PROGRAMMING	
CO-1	Write, Test and Debug Python Programs
CO-2	Implement Conditionals and Loops for Python Programs
CO-3	Use functions and represent Compound data using Lists, Tuples and Dictionaries
CO-4	Use python basic libraries in programming

Course outcomes (Cos) of all courses of all programs offered by the institution

Course Outcomes for Third Year First Semester Course	
Course Code: B20EC3101	
Course Title: Internet of Things	
CO-1	Get familiarity with architecture and communication protocols of IoT
CO-2	Understand IoT sensors and technological challenges faced by IoT devices, with a focus on wireless, energy, power, and sensing modules
CO-3	Explore and learn about Python with the help of Raspberry Pi for preparing projects designed for IoT.
CO-4	Analyze data from physical devices through the cloud using data analytics.
Course Code: B20EC3102	
Course Title: Antennas & Wave Propagation	
CO-1	Understand Radiation mechanism and functions of antennas identify antenna parameters and derive expressions for antenna parameters
CO-2	Analyze and design Antenna arrays.
CO-3	Analyze and design wire and aperture antennas for different applications.
CO-4	Capable of performing various antenna measurements and come up with conclusions about antenna parameters and performance.
CO-5	Identify characteristics of radio wave propagation and be able to design different types of communication links for different frequency bands.
Course Code: B20EC3103	
Course Title: Digital Communication	
CO-1	Understand the basic concepts of sampling and digital communication systems.
CO-2	Understand the concept of binary and M-array modulation techniques.
CO-3	Apply the knowledge of signals & systems and evaluate the performance of various filters in the presence of noise.
CO-4	Understand the concept of probability of error & apply the knowledge of basic digital modulation techniques to evaluate their optimal performance.
CO-5	Analyze the error performance of two digital modulation techniques and understand the concept of spread spectrum communication system
Course Code: **B20EC3104**	
Course Title: Data Communications & Computer Networks	
CO-1	Explain the overview of Data communication principles.
CO-2	Explain the concepts of layered architecture of the OSI modeland TCP/IP model, and the concepts of switching and multiplexing techniques..
CO-3	Analyze flow control, error control and access control issues.
CO-4	Analyze the operation of different network devices, routing, congestion control algorithms, IP protocol and IP addressing.
CO-5	Analyze the performance of transport layer and application layer protocols
Course Code: B20EC3105	
Course Title: Control Systems	
CO-1	Model electrical and mechanical physical systems by applying laws of physics and derive transfer functions from block diagrams & Signal Flow Graphs

CO-2	Analyze systems in time domain for transient and steady-state behavior.
CO-3	Analyze the stability of a system by RH criterion and Root locus
CO-4	Analyze the behavior of system using frequency response plots.
CO-5	Model and analyze the LTI system using state space approach
Course Code: B20EC3106	
Course Title: Electronic Measurements And Instrumentation	
CO-1	Evaluate basics of measurement systems, principle of basic meter
CO-2	Design different transducers for measurement of different parameters.
CO-3	Examining a signal / waveform with different oscillators
CO-4	Use bridges of many types and measure appropriate parameters.
CO-5	Evaluate how a signal can be generated using different types of meters.
Course Code: B20EC3107	
Course Title: Digital System Design Using Hdl	
CO-1	Describe and test digital logic circuits in data flow description, structural description, behavioral description and advanced constructs using VHDL.
CO-2	Describe and test digital logic circuits in data flow description, structural description, behavioral description, and advanced constructs using Verilog.
CO-3	Design complex Combinational and sequential designs using HDL.
CO-4	To Apply the overall knowledge of digital circuit design for testing of digital circuits.
Course Code: B20EC3108	
Course Title: Digital Communication Lab	
CO-1	Design, implement and verify the theoretical concepts of sampling practically.
CO-2	Analyze and implement analog to digital converters like PCM, DM
CO-3	Comprehend the design, application and practical implementation of various Digital Modulation techniques.
CO-4	Analyze digital modulation techniques using MATLAB tools.
Course Code B20EC3109	
Course Title: Internet Of Things Lab	
CO-1	Use wireless peripherals for exchange of data.
CO-2	Make use of Cloud platform to upload and analyze any sensor data.
CO-3	Use of Devices, Gateways and Data Management in IoT.
CO-4	Use the knowledge and skills acquired during the course to build and test a complete, working IoT system involving prototyping, programming, and data analysis.
Course Code B20HS3102	
Course Title: Soft Skills	
CO-1	Apply soft skills in the workplace and build better personal and professional relationships making informed decisions.
CO-2	Participate in group discussions/group activities, exhibit team spirit, use language effectively according to the situation, respond to their interviewer/employer with a positive mind, make answers to the questions asked during their technical/personal interviews, exhibit skills required for the different kinds of interviews (stress, technical, HR) that they would face during the course of their recruitment process.

Course Outcomes for Third Year Second Semester Course	
Course Code: B20EC3201	
Course Title: MICROPROCESSORS AND MICROCONTROLLERS	
CO-1	Illustrate architecture of the 8085 microprocessor.
CO-2	Illustrate architecture of the 8086 microprocessor.
CO-3	Develop 8086 Assembly Language Programs.

CO-4	Illustrate architecture of the 8051 Microcontroller.
CO-5	Implement 8051 Assembly Language Programs.
Course Code: B20EC3202	
Course Title: DIGITAL SIGNAL PROCESSING	
CO-1	Illustrate DT signals, systems and their significance and analyze DTLTI systems using Z-Transform and realize system structures.
CO-2	Analyze DT signals using DFT along with FFT algorithms
CO-3	Design of IIR type of Digital filters as per the specifications
CO-4	Design of FIR type of Digital filters as per the specifications
CO-5	Discuss briefly about DSP applications and understand basic concepts of multi rate signal processing.
Course Code: B20EC3203	
Course Title: VLSI Design	
CO-1	Analyze the Electrical properties and Fabrication processes of MOS circuits.
CO-2	Design the layouts of various MOS circuits by applying the concept of design rules.
CO-3	Interpret the basic MOS circuit concepts, static and dynamic CMOS logic designs and the impact of scaling on MOS circuits.
CO-4	Analyze various testing methods of digital circuits and the basic concepts of FPGA
Course Code: B20HS3202	
Course Title: Universal Human Values-2 : Understanding Harmony	
CO-1	Students are expected to become more aware of themselves, and their surroundings (family, society, nature)
CO-2	They would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind
CO-3	They would have better critical ability
CO-4	They would also become sensitive to their commitment towards what they have understood (human values, human relationship and human society).
CO-5	It is hoped that they would be able to apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.
Course CodeB20EC3205	
Course Title: Microprocessors And Microcontrollers Lab	
CO-1	Develop 8085 assembly language programs on data transfer, arithmetic and logical operations
CO-2	Develop 8086 assembly language programs using data transfer, arithmetic and logical instructions
CO-3	Develop 8051 assembly language programs on data transfer, arithmetic and logical operations.
Course Code: **B20EC3205**	
Course Title: Digital Signal Processing Lab	
CO-1	Make use of the MATLAB simulation tool for performing various operations on discrete signals
CO-2	Make use of the MATLAB simulation tool to verify different DSP algorithms
CO-3	Make use of the MATLAB simulation tool to perform various operations on an Image

Course Code: B20EC3206	
Course Title: Vlsi Lab	
CO-1	Analyse and program synthesizable codes in Verilog/VHDL
CO-2	Design schematics and layouts using CMOS logic and verify their functionality including parasitics using Cadence/Mentor Graphics CAD tools..
Course Code: B20EC3207	
Course Title: Computer Networking Lab	
CO-1	Create IP addressing schemes and verify network connectivity between devices.
CO-2	Configure an internetwork of routers, switches and end devices and troubleshoot the connectivity issues.
Course Code: B20MC3201	
Course Title: Employability Skills	
CO-1	Detect grammatical errors in the text/sentences and rectify them while answering their competitive/company specific tests and frame grammatically Correct sentences while writing.
CO-2	Answer questions on synonyms, antonyms and other vocabulary-based Exercises while attempting CAT, GRE, GATE and other related tests.
CO-3	Use their logical thinking ability and solve questions related to analogy, Syllogisms, and other reasoning-based exercises..
CO-4	Choose the appropriate word/s/phrases suitable to the given context in order to make the sentence/paragraph coherent.
Course Code: B20HS3204	
Course Title: Gender Sensitization	
CO-1	Understand the important issues relating to gender in contemporary India
CO-2	Get sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender.
CO-3	Attain a finer grasp of how gender discrimination works in our society and how to counter it.
CO-4	Acquire insight into the gendered division of labour and its relation to politics and economics.
CO-5	Develop a sense of appreciation for both men and women in all walks of life.

Course Outcomes for Fourth Year First Semester Course	
Course Code: B20HS4102	
Course Title: Managerial Economics And Financial Accountancy	
CO-1	Equip oneself with the knowledge of estimating the Demand and demand elasticities for a product.
CO-2	Have knowledge of Cost and its types and ability to calculate BEP
CO-3	Understand the nature of different markets
CO-4	Understand Pricing Practices prevailing in today's business world
CO-5	Prepare Financial Statements and know how to calculate Profit & Loss for a firm
CO-6	Know Types of capital, their sources & start-ups
Course Code: B20EC4101	
Course Title: Microwave Engineering	
CO-1	To convert one number system to another, analyze logic gates and Boolean theorems.
CO-2	To analyze digital circuits using different minimization techniques.
CO-3	To design various combinational and sequential circuits along with applications.
CO-4	To design counters and state machines by applying the knowledge of synchronous and asynchronous sequential circuits.
Course Code: B20EC4102	
Course Title: DIGITAL IMAGE PROCESSING	
CO-1	Explain digital image fundamentals and basic image processing techniques.
CO-2	Evaluate the techniques for image enhancement and restoration
CO-3	Define the need for image compression and to analyze various image compression methods.
CO-4	Experiment the Partition of a digital image into multiple objects using various techniques.
CO-5	Illustrate the use of different color models to represent an image
Course Code: B20EC4103	
Course Title: **Advanced Micro Controllers**	
CO-1	Illustrate architecture of 8051µp and its modes of operations along with timing diagrams by which improving programming skills on microcontroller
CO-2	Analyze the memory organization, interrupts of PIC 16F877.
CO-3	Understand difference between RISC and CISC.
CO-4	Develop the knowledge of the ARM instruction set.
CO-5	Understand the MSP430 Architecture.
Course Code: B20EC4104	
Course Title: Smart Sensors	
CO-1	Evaluate basics of measurement systems, principle of basic meter
CO-2	Design different transducers for measurement of different parameters
CO-3	Evaluate how a signal can be generated using different types of meters.
CO-4	Use bridges of many types and measure appropriate parameters
CO-5	Investigate a signal/ waveform with different oscillators
Course Code: **B20EC4105**	

Course Title: Information Theory And Coding	
CO-1	Explain concept of Dependent & Independent Source, measure of information, Entropy, Rate of information and Order of a source
CO-2	Represent the information using Shannon Encoding, Shannon Fano, Prefix and Huffman Encoding Algorithms
CO-3	Model the continuous and discrete communication channels using input, output and joint probabilities
CO-4	Determine a codeword comprising of the check bits computed using Linear Block codes, cyclic codes & convolutional codes
CO-5	Design the encoding and decoding circuits for Linear Block codes, cyclic codes, convolutional codes, BCH and Golay codes.
Course Code: B20EC4106	
Course Title: Radar Engineering	
CO-1	Understand the basic working principles of Radars and Apply various mathematical equations to measure the actual Range and unambiguous range of the stationary targets from the radar
CO-2	Understand the basic working principles of some important blocks in Radar receivers
CO-3	Understand the basic working principles of Radars and Apply various mathematical equations to measure the velocity, doppler shift, blind speeds, etc. of the moving targets from the radar
CO-4	Analyze various tracking Radars, advantages and limitations of various tracking radars
C0-5	Understand the basic working principles of some special radars
Course Code: B20EC4107	
Course Title: Low Power Vlsi Design	
CO-1	Understand the sources of power dissipation in digital IC systems.
CO-2	Understand the impact of power on system performance and reliability.
CO-3	Understand leakage sources and reduction techniques
CO-4	Recognise and acquaint with the advanced issues in VLSI systems, specific to the deep-submicron silicon technologies
C0-5	Acquaint with the mechanisms of power dissipation in CMOS integrated circuits
Course Code: B20EC4108	
Course Title: Digital Signal Processors And Architectures	
CO-1	Identify and formalize architectural level characterization of P-DSP hardware.
CO-2	Understand the design, programming (assembly and C), and testing code using Code Composer Studio environment
CO-3	Apply knowledge of various types of addressing modes, interrupts, peripherals and pipelining structure of TMS320C54xx processor.
CO-4	Understand the architectures of ADSP 2100 DSP devices.
CO-5	Analyze various interfacing devices to DSP Processors.
Course Code: B20EC4109	
Course Title: Wireless And Mobile Communications	
CO-1	Understand the concept of cellular communication, upcoming technologies like 3G, 4G etc.
CO-2	Apply the fundamentals of mobile communication systems, cellular concepts and Handoff, calculate the amount of interference, frequency reuse distance and capacity of a cellular system.
CO-3	Apply the knowledge of reflection, diffraction and scattering to calculate link budget using path loss models
CO-4	Understand the concepts of GSM and its architecture
CO-5	Understand the functioning of wireless systems and evolution of different wireless communication systems and standards.
Course Code: B20EC4110	
Course Title: Fiber Optic Communication	
CO-1	Summarize the basic components of optical communication and demonstrate its components
CO-2	Apply basic concepts of optical communication components and systems

CO-3	Understand various sources of light as well as detectors and their comparative study
CO-4	Analyze concepts of optical communication systems for the basic design of optical communication links
CO-5	Understand the wireless access scheme and OWC applications and WDM concepts
Course Code: B20EC4111	
Course Title: Satellite Communications	
CO-1	Choose necessary components required in modern satellite communication systems.
CO-2	Design and build space segment, depending upon the requirement.
CO-3	Design link margin for various applications
CO-4	Choose the correct multiple access technique for better communication
CO-5	Understand the basic concepts of GPS and Satellite navigation
Course Code: B20EC4112	
Course Title: Software Defined Radio	
CO-1	Understanding of analog RF components as front-end block in implementation of SDR.
CO-2	Design circuits at different multi rate signaling techniques for frequency conversion and Sampling issues
CO-3	Understanding of ADC and DAC technology
CO-4	Acquittance of Hardware and software development methods for embedded wireless systems.
CO-5	Make system-level decisions for software defined radio technology and products
Course Code: B20EC4113	
Course Title: Designing Tools	
CO-1	Identify the different microwave components, equipment's and their uses
CO-2	Measure microwave parameters like guide wavelength, frequency, attenuation, VSWR and modes of reflex klystron
CO-3	Measure performance of simple microwave circuits and devices.
CO-4	Analyze the radiation patterns of antennas.
CO-5	Assess the performance of optical devices.

Course Outcomes for Fourth Year Second Semester Course	
Course Code: B20EC4201	
Course Title: Project Work	
CO-1	Identify a current problem through literature/field/case studies
CO-2	Identify the objectives and methodology for solving the problem
CO-3	Design and Develop technology/process for solving the problem
CO-4	Evaluate the technology/process


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