Program Name	Course Code	Course Name	Course Outcomes
Electronics & Telecommunication Engineering	204181	Signals & Systems	CO1: Understand mathematical description and representation of continuous and discrete time signals and systems. CO2: Develop input output relationship for linear shift invariant system and understand the convolution operator for continuous and discrete time system. CO3: Understand and analyse the signals in frequency domain using Fourier series. CO4: Understand and analyse the signals in frequency domain using Fourier transforms. CO5: Understand the limitations of Fourier transform and need for Laplace transform and develop the ability to analyze the system in s- domain. CO6: Understand the basic concept of probability, random variables & random signals and develop the ability to find correlation, CDF, PDF and probability of a given event.
Electronics & Telecommunication Engineering	204182	Electronic Devices & Circuits	CO1: Understand characteristics and parameters of JFET towards its application as amplifier. CO2: Understand MOSETs and perform its DC analysis. CO3: Analyze small signal model of MOSFET. CO4: Understand and analyse applications of MOSFETs. CO5: Understand and analyse feedback amplifiers and Oscillators using FETs. CO6: Understand SMPS and design an adjustable voltage regulator circuits.
Electronics & Telecommunication Engineering	204183	Electrical Circuits and Machines	CO1: Analyze basic AC & DC circuit for voltage, current and power by using KVL, KCL, and network theorems CO2: Design and analyze transformers CO3: Explain the working principle of different DC machines CO4: Explain the working principle of different AC machines. CO5: Explain the working principle of Special purpose DC motors CO6: Explain the working principle of Special purpose AC motors
Electronics & Telecommunication Engineering	204184	Data Structures and Algorithms	CO1: Discuss the computational efficiency of the principal algorithms such as sorting & searching. CO2: Write and understand the programs that use arrays & pointers in C. CO3: Describe how arrays, records, linked structures are represented in memory and use them in algorithms. CO4: Implement stacks & queues for various applications. CO5: Understand various terminologies and traversals of trees and use them for various applications. CO6: Understand various terminologies and traversals of graphs and use them for various applications understand various terminologies and traversals of graphs and use them for various applications
Electronics & Telecommunication Engineering	204185	Digital Electronics	CO1: Analyze, design and implement combinational logic circuits CO2: Analyze, design and implement sequential circuits CO3: Design finite state machines and understand algorithmic state machine. CO4: Understand and analyze characteristics of TTL and CMOS logic families. CO5: Design digital system using PLD and understand various semiconductor memories. CO6: Understand the architecture and use of microcontrollers for basic operations and Simulate using simulation software

Program Name	Course Code	Course Name	Course Outcomes
Electronics & Telecommunication Engineering	204186	Electronic Measuring Instruments & Tools	CO1: Understand the fundamentals of various electrical measurements CO2: Understand and describe specifications, features and capabilities of electronic instruments. CO3: Finalize the specifications of the instrument and select an appropriate instrument for given measurement CO4: Carry out required measurement using various instruments under different setups. CO5: Able to compare measuring instruments for performance parameters. CO6: Select appropriate instruments for the measurement of electrical parameters professionally.
Electronics & Telecommunication Engineering	207005	Engineering Mathematics III	CO1: Solve higher order linear differential equation using appropriate techniques for modelling, analyzing of electrical circuits and control systems. CO2: Apply concept of Fourier transform & Z-transform and its applications to continuous & discrete systems, signal & image processing and communication systems. CO3:; Obtain Interpolating polynomials, numerically differentiate and integrate functions, numerical solutions of differential equations using single step and multi-step iterative methods used in modern scientific computing. CO4: Perform vector differentiation and analyze the vector fields conservative, solenoidal. CO5: Perform vector integration, analyze the vector fields and apply to electro-magnetic fields & wave theory. CO6: Analyze Complex functions, Conformal mappings, Contour integration applicable to electrostatics, digital filters, signal and image processing.
Electronics & Telecommunication Engineering	204187	Integrated Circuits	CO1: Understand internal structure, parameters and characteristics of Op-Amp and Analyze feedback circuits. CO2: Analyse and design linear applications of Op-Amp. CO3: Analyse and design nonlinear applications of Op-Amp CO4: Understand convertors using Op-Amp. CO5: Understand PLL, applications and Design RC oscillators using Op-Amp. CO6: Analyse and design and various types of active filters.
Electronics & Telecommunication Engineering	204188	Control Systems	CO1: Determine and use models of physical systems in forms suitable for use in the analysis and design of control systems CO2: Understand and Perform time domain analysis of control systems required for stability analysis CO3: Evaluate the stability of a closed-loop control system CO4: Perform frequency domain analysis and apply frequency Plot techniques to analyze control systems CO5: Express and solve system equations in state variable form CO6: Differentiate between various controllers and understand the role of controllers in industrial automation
Electronics & Telecommunication Engineering	204189	Analog Communication	CO1: Understand and identify the fundamental concepts and various components of analog communication systems. CO2: Identify and know the functions and thereby the significance of various blocks in AM receivers CO3: Analyze and describe the frequency modulation CO4: Identify and know the functions and thereby the significance of various blocks in FM receivers CO5: Explain signal to noise ratio, noise figure and noise temperature for single and cascaded stages in a communication system CO6: Describe analog pulse modulation techniques and digital modulation techniques.

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Program Name	Course Code	Course Name	Course Outcomes
Electronics & Telecommunication Engineering	204190	Object Oriented Programming	CO1: Describe the principles of object-oriented programming. CO2: Apply the concepts of data encapsulation, inheritance in C++. CO3: Understand basic program constructs in Java. CO4: Apply the concepts of classes, methods and inheritance to write programs in Java. CO5: Use arrays, vectors and strings concepts and interfaces to write programs in Java. CO6: Describe and use the concepts in Java to develop user friendly program.
Electronics & Telecommunication Engineering	204191	Employability Skill Development	CO1: Be equipped with essential communication skills (writing, verbal and nonverbal). CO2: Have skills and preparedness for aptitude tests. CO3: Students develop analytical abilities for matching arrangement, verifications. CO4: Students can make the basic sentences, write and reproduce story. CO5: Master the presentation skill and be ready for facing interviews. CO6: Build team and lead it for problem solving.
Electronics & Telecommunication Engineering	304181	Digital Communication	CO1: Understand working of waveform coding techniques and analyze their performance. CO2: Analyze the performance of a base band digital communication system in terms of error rate and spectral efficiency CO3: Perform the time and frequency domain analysis of the signals in a digital communication system.. CO4: Design of digital communication system. CO5: Analyze the performance of a pass band digital communication system in terms of error rate and spectral efficiency. CO6: Understand working of spread spectrum communication system and analyze its performance.
Electronics & Telecommunication Engineering	304182	Digital Signal Processing	CO1: Understand fundamentals of DSP and Apply the knowledge for the conversion of analog signals and discrete signals. CO2:Apply the Discrete Fourier transform to analyze the discrete time Signals and system CO3: Apply the Z- transform to analyze the discrete time signals and systems. CO4: Design and implement IIR filter for LTI systems. CO5: Design and implement FIR filter for LTI systems. CO6: Develop different signal processing applications using DSP processor.
Electronics & Telecommunication Engineering	304183	Electromagnetics	CO1: Understand the basic mathematical concepts related to electromagnetic vector fields. CO2: Apply the principles of electrostatics to the solutions of problems relating to electric field and electric potential, boundary conditions and electric energy density. CO3: Apply the principles of magneto-statics to the solutions of problems relating to magnetic field and magnetic potential, boundary conditions and magnetic energy density CO4: Apply the concepts related to Faraday's law, induced emf and Maxwell's equations. CO5: Understand and apply the concepts of transmission lines for solution of problems of Electromagnetic waves. CO6: Understand the concepts of uniform plane wave propagation, wave equation and its properties related to transmission of waves.

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Program Name	Course Code	Course Name	Course Outcomes
Electronics & Telecommunication Engineering	304184	Microcontrollers	CO1: Describe architecture and features of typical Microcontroller and write assembly language program using8051 assembly Instructions CO2: Use various hardware and software tools for 8051 and PIC Microcontroller based system development. CO3: Design interfacing of 8051 microcontroller to various peripheral devices CO4: Design interfacing of PIC microcontroller to basic peripheral devices. CO5: Design interfacing of PIC microcontroller to advanced devices using Serial Communication Protocol. CO6: Design small application based on microcontrollers.
Electronics & Telecommunication on Engineering	304185	Mechatronics	CO1: Explain the key elements of mechatronics system CO2: Choose appropriate sensor for required application. CO3: Analyze the working of hydraulic systems CO4: Analyze the working of pneumatic systems. CO5: Be Able to select proper actuator for any Mechatronics system. CO6: Demonstrate case studies of mechatronics system.
Electronics & Telecommunication Engineering	304191	Signal Processing and Communications Lab (DC/DSP)	CO1: Understand fundamentals of DSP and Apply the knowledge for the conversion of analog signals and discrete signals using Matlab. CO2: Apply the Discrete Fourier transform & Z- transform to analyze the discrete time Signals and system using Matlab. CO3: Design and implement IIR & FIR filters using Matlab. CO4: Understand working of waveform coding techniques and analyse their performance. CO5: Understand working of spread spectrum communication system. CO6: Understand line coding.
Electronics & Telecommunication Engineering	304192	Microcontrollers and Mechatronics Lab	CO1: Design Interfacing of 8051 microcontroller to real world devices using software programming and debugging tool CO2: Design Interfacing of PIC18Fxx microcontroller to real world devices using software programming and debugging tool. CO3: Develop microcontroller based system as per given specifications. CO4: Understand different measurement techniques for physical parameters like flow, Velocity. CO5: Understand operation of Hydraulic and Pneumatic System. CO6: Do interfacing of sensors for data acquisition purpose.
Electronics & Telecommunication Engineering	304193	Electronics System Design	CO1: Apply the fundamental concepts and working principles of electronics devices to design electronics systems CO2: Shall be able to interpret datasheets and thus select appropriate components and devices CO3: Select appropriate transducer and signal conditioning circuit to design prototype of Data Acquisition system. CO4: Design an electronic system/sub-system and validate its performance by simulating the same. CO5: Shall be able to use an EDA tool for circuit schematic and simulation. CO6: Create, manage the database and query handling using suitable tools.

Program Name	Course Code	Course Name	Course Outcomes
Electronics & Telecommunication Engineering	304186	Power Electronics	CO1: Design & implement a triggering / gate drive circuit for a power device CO2: Understand, perform & analyze AC-DC controlled converters CO3: Understand, perform & analyze DC-AC controlled converters. CO4: Understand, perform & analyze DC-DC and AC controlled converters. CO5: Design & implement over voltage / over current protection circuit CO6: Evaluate battery backup time & design a battery charger.
Electronics & Telecommunication Engineering	304187	Information Theory, Coding and Communication Networks	CO1: Perform information theoretic analysis of communication system. CO2: Design a channel coding scheme along with data compression and correction for a communication system CO3: Understand and Design cyclic codes for data correction in a communication system CO4: Understand and Design convolutional codes for data correction in a communication system. CO5: Understand and apply fundamental principles of data communication and networking CO6:; Apply flow and error control techniques in communication networks
Electronics & Telecommunication Engineering	304188	Business Management	CO1: Get overview of Management Science aspects useful in business CO2: Understand various domains in Business CO3: Get Quality Aspects for Systematically Running the Business CO4: Develop Project Management aspect and Entrepreneurship Skills.. CO5: Develop Financial management skills. CO6: Get motivation for Entrepreneurship
Electronics & Telecommunication Engineering	306189	Advanced Processors	CO1: Compare different ARM family processors and understand the ARM 7 microprocessor architectures and its features. CO2: Interface basic peripherals to ARM7 based microcontroller furthermore use Serial communication and timer of LPC2148. CO3: Interface the advanced peripherals to ARM7 based microcontroller. CO4: Design ARM7 based embedded system. CO5: Understand DSP processors architectures, feature, and memory structure. CO6: Understand and use DSP Processors for signal processing.
Electronics & Telecommunication Engineering	304190	System Programming and Operating Systems	CO1: Demonstrate the knowledge of Systems Programming and Operating Systems CO2: Formulate the Problem and develop the solution for the same. CO3: Compare and analyze the different implementation approaches of system programming and operating system abstractions. CO4: Interpret various OS functions used in Linux / Ubuntu CO5: To implement memory management techniques. CO6: To analyze I/O software, I/O software layers, disks, disk scheduling Algorithms with respect to linux O.S.
Electronics & Telecommunication Engineering	304194	Power and ITCT Lab	CO1: Design a data compression scheme using suitable source coding technique CO2: Design a channel coding scheme for a communication system. CO3: Evaluate performance of a communication system CO4: Understand VI characteristics of SCR and MOSFET CO5: Observation of output waveforms and measurement of output voltage and firing angle for various converters. CO6: Load and line regulation of SMPS

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Program Name	Course Code	Course Name	Course Outcomes
Electronics & Telecommunication Engineering	304195	Advanced Processors and System Programming Lab	CO1: Design and implement Interfacing of ARM microcontroller to real world devices CO2: Use software development and debugging tools for ARM and DSP processor. CO3: Design and implement basic DSP operations using CCS. CO4: Interpret various OS functions and commands used in Linux / Ubuntu and Write an shell scripting on LINUX OS CO5: Design and implement assembler as per given functionality CO6: Implement different job scheduling algorithms in operating system.
Electronics & Telecommunication Engineering	304196	Employability Skills and Mini Project	CO1: Identify, discuss and Plan the technical aspects of the chosen project with a systematic approach. CO2: Understand and apply acquired knowledge for chosen area of technology during project development. CO3: Design and implement electronic hardware by learning PCB artwork design, soldering techniques, testing and troubleshooting CO4: Work in a team and take a part as individual for development of technical project. CO5: Understand professional way of communication & Prepare a technical report. CO6: Demonstrate mini project and deliver technical seminar.
Electronics & Telecommunication n Engineering	404181	VLSI Design & Technology	CO1: Write effective HDL coding for digital design. CO2: Apply knowledge of real time issues in digital design. CO3: Model/Analyze digital circuits with HDL, simulate, synthesis and prototype in PLDs CO4: Design CMOS circuits for specified applications CO5: Analyze various issues and constraints in design of an ASIC CO6: Apply knowledge of testability in design and build self test circuits
Electronics & Telecommunication Engineering	404182	Computer Networks & Security	CO1: Understand fundamental underlying principles of computer networking. CO2: Describe and analyze the hardware, software, components of a network and their interrelations CO3: Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies CO4: Apply basic knowledge for installing and configuring networking applications. CO5: Specify and identify deficiencies in existing protocols, and then go onto select new and better protocols CO6: Have a basic knowledge of the use of cryptography and network security.
Electronics & Telecommunicati on Engineering	404183	Radiation & Microwave Techniques	CO1: Differentiate various performance parameters of radiating elements CO2: Analyze various radiating elements and arrays CO3: Apply the knowledge of waveguide fundamentals in design of transmission lines CO4: Set up a system consisting of various passive microwave components CO5: Analyze tube based and solid state active devices along with their applications CO6: Measure various performance parameters of microwave components.
Electronics & Telecommunication Engineering	404184	Elective I (IoT)	CO1: Understand the various concepts, terminologies and architecture of IoT systems. CO1: Select various sensors and actuators for design of IoT system CO1: Understand use of various and wireless communication technologies for design of IoT systems. CO1: Understand use of various communication protocols for IoT . CO1: Understand various techniques of data handling and analytics in IoT CO1: Design a small IoT based system using any development board.

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Program Name	Course Code	Course Name	Course Outcomes
Electronics & Telecommunication Engineering	404185	Elective II Electronics in Agriculture	CO1: Understand role of computers & virtual instrumentation CO2: Understand and Provide communication solutions for interpreting environmental parameters with Electronics systems. CO3: Understand Instrument technology used in agriculture. CO4: Understand the role of electronics in precision farming. CO5: Apply knowledge of Electronics in Agriculture. CO6: Understand Greenhouse Technology & Role of Electronics Governance
Electronics & Telecommunication Engineering	404186	Lab Practice -I (CNS+ RMT)	CO1: Understand basic knowledge of installing and configuring networking applications CO2: Specify and identify deficiencies in existing protocols, and then go onto select new and better protocols. CO3: Use modern tools to design a network. CO4: Design, simulate and compare the performance of radiating elements and arrays CO5: Set up a system consisting of active microwave components and measure the performance characteristics. CO6: Measure various performance parameters of passive microwave components
Electronics & Telecommunication Engineering	404187	Lab Practice -II (VLSI + Elective I)	CO1: Design and Build small IoT based systems for control or monitoring of applications CO2: Design Interfacing of various development boards to real world sensor and actuators. CO3: Use various software tools and programming languages for IOT based project development CO4: Design VHDL code for digital circuit, Simulate with test bench, synthesize and implement on PLD CO5: Design and simulate CMOS layouts in software tool. CO6: Design a VLSI based system used for control and monitoring applications
Electronics & Telecommunication Engineering	404188	Project Stage I	CO1: Subject knowledge- Identify problem statement through literature survey for project work CO2: Knowledge Application- Understand socio economic need to develop application for the solution CO3: Problem solving skill- Develop design strategy and use use modern tools to execute project work CO4: Acquire new skills- Understand project development lifecycle, acquire domain specific and interdisciplinary skills. CO5: Ethics- Access application of project work with appropriate social , health, safety, environmental, ethical consideration. CO6: Communication and collaborative skills- Develop collaborative skills, presentation and interpersonal and intrapersonal communication skills through project work.
Electronics & Telecommunication Engineering	404189	Mobile Communication	CO1: Apply the concepts of switching technique and traffic engineering to design multistage networks. CO2: Explore the architecture of GSM. CO3: Differentiate thoroughly the generations of mobile technologies. CO4: Understand and analyse cellular concepts. CO5: Understand and analyse call processing functions. CO6: Understand and analyze evolution of mobile technologies.

Program Name	Course Code	Course Name	Course Outcomes
Electronics & Telecommunication Engineering	404190	Broadband Communication System	CO1: Understand the basic components of fiber optic communication link. CO2: Perform Link power budget and Rise Time Budget by proper selection of components and check its viability. CO3: Understand the system design issues and the role of WDM components in advanced light wave systems. CO4: Understand the basics of orbital mechanics and the look angles from ground stations to the satellite. CO5: Understand satellite subsystems, Altitude And Control Systems (AOCS), Telemetry, Tracking, Command and Monitoring, Power systems, and Communication subsystems. CO6: Perform Satellite Link design for UpLink and DownLink.
Electronics & Telecommunication Engineering	404191	Elective III (Audio Video Engineering)	CO1: Apply the fundamentals of Analog Television and Color Television standards CO2: Explain the fundamentals of Digital Television, DTV standards and parameters. CO3: Understand various HDTV standards and acquainted with different types of HDTV systems CO4: Understand advance television technology and standards CO5: Understand fundamentals of Audio-Video Recording CO6: Understand acoustic fundamentals and various acoustic systems
Electronics & Telecommunication Engineering	404192	Elective IV (Wireless Sensor Network)	CO1: Explain various concepts and terminologies used in WSN CO2: Describe importance and use of radio communication and link management in WSN CO3: Explain various wireless standards and protocols associated with WSN CO4: Recognize importance of localization and routing techniques used in WSN CO5: Understand techniques of data aggregation and importance of security in CO6: Examine the issues involved in design and deployment of WSN
Electronics & Telecommunication Engineering	404193	Lab Practice –III (MC+BCS)	CO1: Understand AT commands for voice and data operation, VoIP call routing process, PSTN switch CO2: Analyze Lost call system/delay system of voice/data traffic, bit error rate in presence of AWGN, GMSK/QPSK/QAM Modulation CO3: Measure bit error rate in presence of Hata/ Multipath propagation model for Link budget, Multiple access techniques such as TDMA/CDMA/OFDMA. Visit to Mobile Telephone Switching Office (MTSO). CO4: Understand Numerical aperture of optical fiber & characteristics of various sources and detectors. CO5: Analyze optical fiber attenuation, Power and time budget, direct communication link between Uplink Transmitter and Downlink Receiver CO6: Analyze AUDIO-VIDEO satellite link between Transmitter and Receiver.
Electronics & Telecommunication Engineering	404194	Lab Practice –IV (Elective III)	CO1: Analyze voltage waveform for color TV. CO2: Investigate different faults in Digital Television. CO3: Understand the operation of Wi-Fi, HDTV and Digital TV system CO4: Simulate of Video, Audio and Image compressing techniques CO5: Understand the working of audio system – CD player and MP3 player CO6: Understand public address system.

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Program Name	Course Code	Course Name	Course Outcomes
Electronics & Telecommunication Engineering	404195	Project Stage II	CO1: Subject Knowledge: Identify the problem statement through literature survey for project work. CO2: Knowledge Application: Understand the soci-economic need to develop the application for the solution. CO3: Problem Solving Skills :Develop design strategy and use of modern tools to execute the project work CO4: Acquire new skills: To understand project development life cycle, acquire the domain specific and Interdisciplinary skills. CO5: Ethics: Assess application of project work with appropriate societal, health,safety, environmental and ethical Consideration CO6: Communication and Collaborative skills: Develop collaborative skills,presentation and interpersonal and intrapersonal communication skills through project work.