DEPARTMENT OF ELECTRONICS & TELECOMMUNICATION

SECOND YEAR

SEMESTER-I		
Course Name & Code	**Course Outcomes**	**Bloom's Level**
Engineering Mathematics-III (ET211)	Solve higher order linear differential equations and problems on electrical circuit theory	BL3: Apply
	Apply Laplace and inverse Laplace transforms for analysis of simple electrical circuits	BL3: Apply
	Show and solve a function in terms of sine's and cosines components so as to model simple periodic functions	BL3: Apply
	Solve the problems of Fourier integral and Fourier transform	BL3: Apply
	State the relation between two variables for the given data using regression and explain probability distribution functions	BL2 Understand
	Solve simultaneous linear equations and nonlinear equations & problems on Z transform &its properties	BL3: Apply
Electronics Circuit Analysis and Design (ET212)	Students can analyze the working of JFET, MOSFET and applications of these devices	BL4: Analyze
	Student can design and analyze multistage amplifier.	BL4: Analyze
	Student can design and analyze feedback amplifier.	BL4: Analyze
	Student can design and analyze power amplifiers.	BL4: Analyze
	Student can design and analyze oscillators.	BL4: Analyze
Network Theory & Analysis (ET213)	Analyze linear circuit with use of different network theorems and analysis methods	BL3 Apply, BL4 Analyze
	Analyze series and parallel resonance circuits.	BL3 Apply, BL4 Analyze
	Compute two port network parameters and draw equivalent network.	BL3 Apply, BL4 Analyze
	Determine transient and steady state response of	BL3 Apply,

	linear circuits.	BL4 Analyze
	Analyze network function for 1 and 2 port network.	BL3 Apply, BL4 Analyze
	Design passive filter and attenuator circuits.	BL3 Apply, BL4 Analyze
Digital Techniques (ET214)	Understand the fundamentals of digital logic and circuits.	BL1: Remember
	Design and realize combinatoal logic circuits using gates,MSI circuits and PLDs.	BL3: Apply
	Design, implement and analyze asynchronous and synchronous sequential circuits using flip flops.	BL3: Apply
	Understand the concept of memory and PLDs.	BL2 Understand
	Design and simulate VHDL modules for combinational logic circuits.	BL3: Apply
Analog Communication (ET215)	Explain the need and types of modulation.	BL2 Understand
	Calculate the noise in communication system	BL3: Apply
	Illustrate types of Amplitude modulation and demodulation .	BL2 Understand
	Illustrate types of Frequency Modulation and demodulation.	BL2 Understand
	Use sampling techniques for Analog pulse modulation and demodulation methods.	BL3: Apply
Electronic Software Lab-I (ET216)	Implement arrays, structures & functions	BL3: Apply
	Use string library functions and array of string	BL3: Apply
	Implement dynamic memory allocation	BL3: Apply

SEMESTER-II		
Course Name & Code	**Course Outcomes**	**Bloom's Level**
Control System (ET221)	Explain applications of control system	BL2 Understand
	Model the Mechanical and Electrical systems	BL2 Understand
	Solve the problems on system reduction.	BL3: Apply
	Compute the stability of system.	BL3: Apply
	Plot Bode plot, Root Locus for given system.	BL3: Apply
Analog Integrated Circuits (ET222)	Describe fundamentals of op amp and compare characteristics of ideal and practical op amp	BL2 Understand
	Understand and analyze frequency response of op amp	BL2 Understand
	Build various Linear and Nonlinear applications of op amp	BL3: Apply
	Design first order and second order filters	BL3: Apply
	Design and build waveform generators and oscillators of desired frequency.	BL3: Apply
	Understand and describe the concept of special ICs and its applications	BL2 Understand
Principles of Digital Communication (ET223)	Solve problems related to information theory & entropy coding	BL3: Apply
	Illustrate and compare different pulse code modulation techniques.	BL3: Apply
	Analyze the transmitter & receivers of digital modulation techniques	BL3: Apply
	Illustrate the different synchronization methods used in the coherent receivers.	BL3: Apply
	Explain multichannel and multicarrier communication system	BL2 Understand
	Use linear block codes for encoding and decoding	BL3: Apply
Signals and Systems (ET224)	Analyse the types of basic signal, its properties	BL2 Understand

	Use a concept of convolution integral and convolution sum	BL1: Remember
	Represent and analyse LTI system by differential and difference equations	BL3: Apply
	Use concept of sampling theorem to analyse signals	BL3: Apply
	Determine Fourier Transform and Z-transform of signals	BL2 Understand
	Solve questions on signals and systems for various competitive examinations	BL3: Apply
Data Structure (ET225)	Ability to define and apply the concept of stack , queue.	BL3: Apply
	Ability to define and apply the concept of linked list.	BL3: Apply
	Ability to define and apply the concept of recursion.	BL3: Apply
	Ability to select non-linear structures for autonomous realization of simple programs.	BL1: Remember
	Ability to implement and analyze various searching algorithms.	BL4: Analyze
	Ability to implement and analyze various sorting algorithms.	BL4: Analyze
Electronic Software Lab-II (ET226)	Use electronic circuit design software	BL2 Understand
	Use signal processing toolbox for signal processing application	BL2 Understand
	Design PCB using PCB designing software which is the production domain for various small firmwares	BL3: Apply

THIRD YEAR

SEMESTER-I		
Electromagnetic Field Theory (ET311)	Utilize the mathematical concepts in Electromagnetic field	BL3: Apply
	Interpret the concepts and solve numerical of Electrostatic field.	BL2 Understand
	Verify various laws of Magneto static field.	BL4: Analyze
	Summaries Maxwell's equation to interpret wave propagation.	BL2 Understand
	Analyze the Electromagnetic wave propagation in different media.	BL4: Analyze
	Apply knowledge of Smith chart to determine transmission line parameters.	BL3: Apply
Digital Design & HDL (ET312)	Explain different syntax of VHDL language.	BL2 Understand
	Design, simulate and analyze combinational and sequential logic circuits using VHDL.	BL3: Apply
	Design, simulate and analyze combinational logic circuits using Verilog.	BL3: Apply
	Explain different testing methods for combinational and sequential logic and write test bench for simple combinational circuit.	BL4: Analyze
	Describe architecture and internal components of CPLD, FPGA, ASIC and SOC and compare them.	BL2 Understand
Digital Signal Processing (ET313)	Solve problems based on Correlation and DFT,	BL3: Apply
	Analyze response of the system using linear filtering	BL3: Apply
	Calculate FFT of the Discrete signal	BL3: Apply
	Calculate and analyze FIR & IIR filter coefficients using different techniques.	BL4: Analyze
	Realize transfer function of FIR & IIR filters using different methods	BL3: Apply
	Apply concepts of DSP in various applications	BL3: Apply
Microcontrollers And Applications (ET314)	Describe the fundamental features and operation of 8051 microcontroller	BL2 Understand

	Develop and practice assembly language or C-language programming techniques for 8051 microcontroller	BL3: Apply
	Interface various I/Os and peripherals with 8051 microcontroller	BL3: Apply
	Illustrate the various core and peripheral features for programming in PIC 16F877 Microcontroller	BL2 Understand
	Describe various communication protocols used in PIC 16F877 Microcontroller	BL2 Understand
Business Ethics (ET315-A)	Eloborate concept of ethics and related theories	BL2 Understand
	Describe and apply tools for decision making and management in business ethics	BL3: Apply
	Understand and form the ethical issues in corporation	BL2 Understand
	Understand and identify the ethical issues from various stakeholders point of context	BL2 Understand
	Understand the impacts of Globalization on the nature and extent of the role played by civil society towards corporations	BL2 Understand
	Understand and identify the ethical issues in the relations between Business and Government	BL2 Understand
lectronic Software Lab-III (ET316)	Understand the basics of Python language using concepts of C language.	BL2 Understand
	Interpret the fundamental python syntax and semantics.	BL5: Evaluate
	Apply the methods to create and manipulate python programs by utilizing the data structures like lists, dictionaries, tuples.	BL3: Apply
	Understand the Python programming concepts such as encapsulation, inheritance, and polymorphism	BL2 Understand

SEMESTER-II		
Antenna & Wave Propagation (ET321)	Identify basic antenna parameters.	BL1: Remember
	Analyze radiation pattern of various antennas.	BL3: Apply
	Illustrate techniques for antenna parameter measurements.	BL3: Apply
	Identify the characteristics of radio wave propagation.	BL2 Understand
	Understand the various applications of antenna.	BL2 Understand
Embedded System (ET322)	Understand the concept of recent trends in Embedded System	BL2 Understand
	Demonstrate the understanding of advanced ARM core families architecture.	BL2 Understand
	Understand the Fundamentals of On chip Peripherals of lpc2148	BL2 Understand
	Write program for interfacing ARM processor with Input and Output devices.	BL3: Apply
	Analyze Real Time Operating Systems like µCOSII.	BL4: Analyze
	Understand and analyze the various case studies of ES.	BL2 Understand
Electronic System Design (ET323)	Elaborate construction and working of different power semiconductor devices.	BL2 Understand
	Understand the use of power devices in industrial applications.	BL3: Apply
	Design different PLL applications	BL4: Analyze
	Design Timer , Frequency counter and digital voltmeter	BL4: Analyze
	Identify and Implement the design aspect for solving industrial problems	BL3: Apply
Advanced Mobile Communication (ET324)	Interpret how cellular systems work in mobile communication.	BL2 Understand

	Distinguish between different mobile network technologies.	BL2 Understand
	Determine the channel capacity of cellular system	BL5: Evaluate
	Analyze the different services of GSM	BL4: Analyze
	Illustrate the knowledge of spread spectrum for CDMA traffic analysis	BL2 Understand
	Analyze the emerging technologies of 4G LTE & 5G for Next Generation	BL4: Analyze
Optical Communication (ET325-A)	Interpret how cellular systems work in mobile communication.	BL2 Understand
	Distinguish between different mobile network technologies.	BL2 Understand
	Determine the channel capacity of cellular system	BL2 Understand
	Analyze the different services of GSM	BL3: Apply
	Illustrate the knowledge of spread spectrum for CDMA traffic analysis	BL2 Understand
	Analyze the emerging technologies of 4G LTE & 5G for Next Generation	BL4: Analyze
Sensors & Applications (ET325-B)	Elaborate the concept of sensors and its characteristics.	BL2 Understand
	Describe the physical principles of analog and digital sensors.	BL2 Understand
	Design sensor interface circuits for a given engineering problem.	BL3: Apply
	Select an appropriate sensor based on a given engineering application	BL1: Remember
	Describe the principle of sensor material and technology of a sensor.	BL2 Understand
	Describe the working principle of different types of actuators.	BL2 Understand

Mini Hardware Project (ET326)	Produce PCB artwork using an appropriate EDA tool.	BL4: Analyze
	Practice good soldering, testing, fault detection and effective trouble-shooting.	BL2 Understand
	Design and implement application based hardware project.	BL3: Apply
	Present technical seminar and display the project.	BL2 Understand

FOURTH YEAR

SEMESTER - I		
Computer Communication Network (ET411)	Understand basics of computer network.	BL2 Understand
	Describe different types of topologies and protocols	BL2 Understand
	Understand and differentiate layered network models.	BL2 Understand
	Identify and describe network devices and standards.	BL2 Understand
	Demonstrate application of various protocols at different network levels.	BL3: Apply
Embedded System Design (ET412)	Understand the various recent trends in Embedded System	BL2 Understand
	Demonstrate the understanding of ARM core architecture and On-chip Peripherals.	BL3: Apply
	Differtiate and illustrate different Communication Protocols.	BL3: Apply
	Write program for interfacing ARM processor with Input and Output devices.	BL3: Apply
	Illustrate the concept of Real Time Operating System	BL2 Understand
	Understand and analyze the various case studies of ES.	BL2 Understand
Satellite Communication (ET413)	Explain the fundamentals of of Satellite Communication.	BL2 Understand
	Describe the different subsystems of Satellite.	BL2 Understand
	Evaluate different parameters for satellite link design.	BL3: Apply
	Explain different types of earth station.	BL2 Understand
	Analyze types of orbits for various parameters.	BL4: Analyze
	Apply the concept of Satellite navigation for GPS and broadcasting services.	BL3: Apply
Database Management System (DBMS) (ET414)	Define and apply the basic concepts of database system, design, relational model and schemas.	BL3: Apply

	Design principles for logical design of databases, including the ER method and normalization approach for any real time application.	BL6: Create
	Evaluate, using relational algebra and SQL, solutions to a broad range of query problems in a relational DBMS.	BL5: Evaluate
	Demonstrate an understanding of normalization theory and apply such knowledge to normalize a database.	BL2 Understand
	Define and apply the concepts of indexing and hashing.	BL1: Remember
	Familiar with the basic issues of transaction processing (ACID properties), different methods of concurrency control and recovery techniques.	BL5: Evaluate
Image & Video Processing (ET415)	Understand the fundamentals of digital image processing.	BL2 Understand
	Apply mathematical tools for processing images	BL3: Apply
	Apply image enhancement techniques in time and frequency domain	BL3: Apply
	Apply image segmentation techniques	BL3: Apply
	Analyze images using basic image analysis techniques	BL4: Analyze
	Understand the various video processing Techniques	BL2 Understand
Seminar & Project (ET416)	Collect information, understand and describe it.	BL1: Remember
	Write technical document to represent and identify the problem.	BL4: Analyze
	Show the abilty to communicate effectively as an indivisual.	BL3: Apply
	Use the techniques, skills and modern tools.	BL3: Apply
	Understand professional and ethical responsibilty.	BL2 Understand
Vocational Training (ET417	Follow and practice industrial norms	BL3: Apply
	Integrate classroom theory with workplace practice	BL3: Apply
	Develop new and advance skills	BL3: Apply
	Demonstrate competency in relevant field through problem identification, formulation and solution	BL3: Apply

SEMESTER -II		
Internet Of Things (IOT) (ET421)	Student can elaborate different components of an IoT System.	BL2 Understand
	Student can choose embedded platforms used in IoT.	BL3: Apply
	Student can write interfacing program for different applications with ARM.	BL6: Create
	Student can describe different communication technologies.	BL5: Evaluate
	Student can classify application protocols Used in IoT.	BL4: Analyze
	Student can write different cloud platforms of IoT.	BL3: Apply
Multimedia Communication Techniques (ET422)	Interprete working of monochrome and color television transmitter and receiver.	BL2 Understand
	Identify globally accepted colour TV standards	BL1: Remember
	Analyse different types of modern televisions and audio systems	BL4: Analyze
	Understand the concept of multimedia and data representation.	BL2 Understand
	Analyze different audio and video compression techniques.	BL4: Analyze
VLSI Design (ET423)	Explain different syntax of VHDL language.	BL2 Understand
	Design, simulate and analyze combinational and sequential logic circuits using VHDL.	BL3: Apply
	Explain different testing methods for combinational and sequential logic and write test bench for simple combinational circuit.	BL4: Analyze
	Explicate the terms associated to MOS transistor and CMOS logic	BL2 Understand
	Implement logic gates and simple Boolean expression using CMOS logic.	BL3: Apply
	Describe CPLD and FPGA architecture and its internal components and explain concept of ASIC and SOC.	BL2 Understand

Network Security(ET424)	Apply the concept of Ciphers to encrypt data for security	BL3: Apply
	Explain use of block cipher in data encryption standerd comparing it with stream ciphers.	BL2 Understand
	Illustrate different modes used in cryptographic algorithms.	BL2 Understand
	Explain the security used in Email and IP	BL2 Understand
	Identify and explain various attacks and tools	BL2 Understand
	Discuss on cybercrime and cybercriminals	BL2 Understand
Project (ET325)	Identify, Formulate and solves Electronics and Telecommunication Engineering problems.	BL2 Understand
	Analyze and design the solution using design tools and techniques.	BL4: Analyze
	Develop ability to work on multidisciplinary level.	BL3: Apply
	Show the ability to communicate effectively in team.	BL3: Apply
	Understand the impact of engineering solutions in a global, economic, environmental and societal context.	BL2 Understand
	To perform as a Indivisual and team members for effective execution of project.	BL3: Apply