INFO INSTITUTE OF ENGINEERING, COIMBATORE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PROGRAM OUTCOMES

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 sustainable 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 understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary 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.

PROGRAMME EDUCATIONAL OBJECTIVES

PEO I	To enable graduates to pursue research, or have a successful career in academia or industries associated with Electronics and Communication Engineering, or as entrepreneurs.
PEO II	To provide students with strong foundational concepts and also advanced techniques and tools in order to enable them to build solutions or systems of varying complexity.
PEO III	To prepare students to critically analyze existing literature in an area of specialization and ethically develop innovative and research oriented methodologies to solve the problems identified.

PROGRAM SPECIFIC OUTCOMES

- To analyze, design and develop solutions by applying foundational concepts of electronics and communication engineering.
- To apply design principles and best practices for developing quality products for scientific and business applications.
- To adapt to emerging information and communication technologies (ICT) to innovate ideas and solutions to existing/novel problems.

COURSE OUTCOMES

Regulation 2017 Anna University Chennai

SUBJECT	COs	

I Semester		
HS8151 Communicative English	CO1	Read articles of a general kind in magazines and newspapers.
	CO2	Participate effectively in informal conversations; introduce themselves and their friends and express opinions in English.
	CO3	Comprehend conversations and short talks delivered in English.
	CO4	Write short essays of a general kind and personal letters and emails in English.
MA8151 Engineering Mathematics - I	CO1	Use both the limit definition and rules of differentiation to differentiate functions.
	CO2	Apply differentiation to solve maxima and minima problems.
	CO3	Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus.
	CO4	Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables.
	CO5	Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts
	CO6	Determine convergence/divergence of improper integrals and evaluate convergent improper integrals.
	CO7	Apply various techniques in solving differential equations.
PH8151 Engineering Physics	CO1	The students will gain knowledge on the basics of properties of matter and its applications
	CO2	The students will acquire knowledge on the concepts of waves and optical devices and their applications in fibre optics.
	CO3	The students will have adequate knowledge on the concepts of thermal properties of materials and their applications in expansion joints and heat exchangers.
	CO4	The students will get knowledge on advanced physics concepts of quantum theory and its applications in tunneling microscopes.
	CO5	The students will understand the basics of crystals, their structures and different crystal growth techniques.
CY8151 Engineering Chemistry	CO1	To infer the quality of water from quality parameter data and propose suitable treatment methodologies to treat water.
GE8151 Problem Solving and Python	CO1	Develop algorithmic solutions to simple computational problems.
	CO2	Read, write, execute by hand simple Python programs.

Programming	CO3	Structure simple Python programs for solving problems.
	CO4	Decompose a Python program into functions.
	CO5	Represent compound data using Python lists, tuples, and dictionaries.
	CO6	Read and write data from/to files in Python Programs.
GE8152 Engineering Graphics	C01	Familiarize with the fundamentals and standards of Engineering graphics.
	CO2	Perform freehand sketching of basic geometrical constructions and multiple views of objects.
	CO3	Project orthographic projections of lines and plane surfaces.
	CO4	Draw projections and solids and development of surfaces.
	CO5	Visualize and to project isometric and perspective sections of simple solids.
GE8161 Problem Solving and Python Programming Laboratory	CO1	Write, test, and debug simple Python programs.
	CO2	Implement Python programs with conditionals and loops.
	CO3	Develop Python programs step-wise by defining functions and calling them.
	CO4	Use Python lists, tuples, dictionaries for representing compound data.
	CO5	Read and write data from/to files in Python.
BS8161 Physics and Chemistry Laboratory	CO1	Apply principles of elasticity, optics and thermal properties for engineering applications.
	CO2	The students will be outfitted with hands-on knowledge in the quantitative chemical analysis of water quality related parameters.

II Semester		
HS 8251 Technical English	CO1	Read technical texts and write area- specific texts effortlessly.
	CO2	Listen and comprehend lectures and talks in their area of specialization successfully.
	CO3	Speak appropriately and effectively in varied formal and informal contexts.
	CO4	Write reports and winning job applications.
MA8251 Engineering Mathematics – II	CO1	Eigenvalues and eigenvectors, diagonalization of a matrix, Symmetric matrices, Positive definite matrices and similar matrices.
	CO2	Gradient, divergence and curl of a vector point function and related identities.
	CO3	Evaluation of line, surface and volume integrals using Gauss, Stokes and Green's theorems and their verification.
	CO4	Analytic functions, conformal mapping and complex integration.
	CO5	Laplace transform and inverse transform of simple functions, properties, various related theorems and application to differential equations with constant coefficients.
PH8253 Physics For Electronics Engineering	CO1	Gain knowledge on classical and quantum electron theories, and energy band structures
	CO2	Acquire knowledge on basics of semiconductor physics and its applications in various devices.
	CO3	Get knowledge on magnetic and dielectric properties of materials.
	CO4	Have the necessary understanding on the functioning of optical materials for optoelectronics.
	CO5	Understand the basics of quantum structures and their applications in spintronics and carbon electronics.
BE8254 Basic Electrical and Instrumentation Engineering	CO1	Understand the concept of three phase power circuits and measurement.
	CO2	Comprehend the concepts in electrical generators, motors and transformers.
	CO3	Choose appropriate measuring instruments for given application.
EC8251 Circuit Analysis	CO1	Apply the basic concepts of circuit analysis such as Kirchoff's laws, mesh current & node voltage method for analysis of DC and AC circuits.
	CO2	Understand different methods of circuit analysis using Network theorems, duality and topology.
	CO3	Analyze frequency response of parallel & series resonance circuits and understand the concept of coupling circuits.
	CO4	Analyze the transient and steady state response of the circuits subjected to step and sinusoidal excitations.
	CO5	Design two port networks and describe its properties.
EC8252 Electronic Devices	CO1	Analyze the characteristics of PN junction diodes.
	CO2	Discuss the theory, construction, and operation of Bipolar junction Transistors.

	CO3	Compare and analysis the characteristics of FET and MOSFET transistors.
	CO4	Summarize the characteristics of special Semiconductor Devices.
	CO5	Describe the principles underlying the design, manufacture, and uses of power devices & display devices.
EC8261 **Circuits and Devices** **Laboratory**	CO1	Analyze the characteristics of basic electronic devices.
	CO2	Compare the performance analysis of different transistor configurations.
	CO3	Analyze the characteristic behavior of SCR, clipper and clamper circuits.
	CO4	Verify Thevinin & Norton theorem KVL & KCL, and Super Position Theorems.
	CO5	Design and analyze series and parallel RLC circuits.
GE8261 **Engineering Practices** **Laboratory**	CO1	Know about Electronic components and equipments– Resistor, colour coding measurement of AC signal parameter.
	CO2	Understand the basics of logic gates such as AND, OR, EX-OR and NOT.
	CO3	Generate Clock Signal.
	CO4	Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.
	CO5	Measure of ripple factor of HWR and FWR.

		III Semester	
MA8352 Linear Algebra And Partial Differential Equations	CO1	Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts.
	CO2	Demonstrate accurate and efficient use of advanced algebraic techniques.
	CO3	Demonstrate their mastery by solving non - trivial problems related to the concepts and by proving simple theorems about the statements proven by the text.
	CO4	Able to solve various types of partial differential equations
	CO5	Able to solve engineering problems using Fourier series.
EC8393 Fundamentals of Data Structures In C	CO1	Implement linear and non-linear data structure operations using C
	CO2	Suggest appropriate linear / non-linear data structure for any given data set.
	CO3	Apply hashing concepts for a given problem.
	CO4	Modify or suggest new data structure for an application
	CO5	Appropriately choose the sorting algorithm for an application
EC8351 Electronic Circuits I	CO1	Designing of various biasing circuits such as BJT, JFET and MOSFET.
	CO2	Design and analyze of BJT amplifier circuit.
	CO3	Design and analyze of single stage FET,MOSFET and amplifier circuits.
	CO4	Analyze the frequency response of amplifiers.
	CO5	To troubleshoot and fault analysis of power supplies.
EC8352 Signals and System	CO1	To understand the basic properties of signals & systems.
	CO2	Analyze continuous time signals using Fourier and Laplace Transforms
	CO3	Characterizing LTI systems using Fourier and Laplace Transforms.
	CO4	Analyze discrete time signals using Z transform and DTFT
	CO5	Analyze discrete time LTI systems using Z transform and DTFT.
EC8392 Digital Electronics	CO1	To understand the digital fundamentals, Boolean algebra and its applications in digital system
	CO2	Design and implementation of Combinational circuits using various logical gates.
	CO3	Design and implement Synchronous sequential circuits
	CO4	Design and implement Asynchronous sequential circuits
	CO5	Apply the concepts of different semiconductor memory devices and digital integrated circuits.
EC8391 Control Systems Engineering	CO1	To Describe each component of the control system and how it is represented.
	CO2	Perform time domain analysis of control systems and design the compensation technique required for stability.
	CO3	Perform frequency domain analysis of control systems and design the

		compensation technique required for stability.
	CO4	Examine the stability of the system using different methods
	CO5	Design various transfer functions of digital control system using state variable models.
EC8381 Fundamentals of Data Structures in C Laboratory	CO1	Write basic and advanced programs in C
	CO2	Implement functions and recursive functions in C
	CO3	Implement data structures using C
	CO4	Choose appropriate sorting algorithm for an application and implement it in a modularized way
EC8361 Analog and Digital Circuits Laboratory	CO1	Plot the frequency response of CE, CB, CC &CS amplifier.
	CO2	Differentiate cascade and cascode amplifier and measure CMRR in differential amplifier.
	CO3	Analyze the limitation in bandwidth of single stage and multi stage amplifier.
	CO4	Design and implementation of various digital circuits.
	CO5	Simulate and analyze amplifier circuits using Spice
HS8381 Interpersonal Skills/Listening&Speaking	CO1	Listen and respond appropriately.
	CO2	Participate in group discussions
	CO3	Make effective presentations.
	CO4	Participate confidently and appropriately in conversations both formal and informal

IV Semester			
MA8451 Probability and Random Processes	CO1	Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.	
	CO2	Understand the basic concepts of one and two dimensional random variables and apply in engineering applications.	
	CO3	Apply the concept random processes in engineering disciplines.	
	CO4	Understand and apply the concept of correlation and spectral densities.	
	CO5	The students will have an exposure of various distribution functions and help in acquiring skills in handling situations involving more than one variable. Able to analyze the response of random inputs to linear time invariant systems.	
EC8452 Electronic Circuits II	CO1	Analyze various topologies of feedback amplifiers.	
	CO2	Design and Analyze various types of oscillators.	
	CO3	Analyze the performance of tuned amplifiers.	
	CO4	Inspect and model Wave Shaping Circuits and Multivibrators.	
	CO5	Apply the various design methodologies to power amplifiers and DC converters analysis.	
EC8491 Communication Theory	CO1	To describe the concepts of various analog modulation and their spectral characteristics.	
	CO2	Design of Angle modulation and demodulation techniques.	
	CO3	Apply the concepts of Random Process to the design of communication system.	
	CO4	Analyze the noise performance of AM and FM systems	
	CO5	To understand the concepts of sampling and quantization theories.	
EC8451 Electromagnetic Fields	CO1	Conceptual and basic mathematical understanding of electric and magnetic fields in free space and in materials.	
	CO2	Describe the rules governing electro static field and the properties of conductors and dielectrics.	
	CO3	Analyze field potentials due to static magnetic fields and realize the effect of forces and materials in magnetic fields.	
	CO4	Understand the relation between the fields under time varying situations and discuss the solutions for field propagation using Maxwell's equation.	
	CO5	Understand the electromagnetic wave propagation in lossless and in lossy media	
EC8453 Linear Integrated Circuits	CO1	Elaborate the basic building blocks of Operational Amplifiers and their characteristics.	
	CO2	Design linear and non linear applications of op – amps.	
	CO3	Design applications using analog multiplier and PLL	
	CO4	Design ADC and DAC using op – amps.	
	CO5	Design waveforms generators using op – amp circuits and analyze some special function ICs.	
GE8291 Environmental Sciences and	CO1	To recognize and understand the functions of environment, ecosystems and biodiversity and their conservation.	
	CO2	To identify the causes, effects of environmental pollution and natural disasters	

Engineering		and contribute to the preventive measures in the society.
	CO3	To identify and apply the understanding of renewable and non-renewable resources and contribute to the sustainable measures to preserve them for future generations.
	CO4	To recognize the different goals of sustainable development and apply them for suitable technological advancement and societal development.
	CO5	To demonstrate the knowledge of sustainability practices and identify green materials, energy cycles and the role of sustainable urbanization.
EC8461 Circuits Design and Simulation Laboratory	CO1	Design of various types of feedback amplifiers and plot its frequency response.
	CO2	Design and analyze various oscillators
	CO3	Design wave-shaping circuits and multivibrators
	CO4	Design and simulate feedback amplifiers, oscillators, tuned amplifiers, using SPICE Tool.
	CO5	Design and simulate wave-shaping circuits and multivibrators using SPICE Tool.
EC8462 Linear Integrated Circuits Laboratory	CO1	Design oscillators and amplifiers using operational amplifiers.
	CO2	Design filters using Operational amplifier and perform analysis on frequency response
	CO3	Analyze the working of PLL and its use as frequency multipliers.
	CO4	Design of DC power supply using ICs and Astable & Monostable multivibrators using NE555 Timer.
	CO5	Analyze the performance of oscillators, A/D convertors and multivibrators using SPICE

V Semester			
EC8501 **Digital** **Communication**	CO1	Understand the basics of information theory and various source coding techniques of discrete memoryless channels.	
	CO2	Design of PCM systems and the various waveform coding schemes.	
	CO3	Design and implement base band transmission schemes.	
	CO4	Understand the various Digital modulation schemes and analyze the spectral characteristics of band pass signaling with their noise performance.	
	CO5	Design error control coding schemes	
EC8553 **Discrete-Time** **Signal Processing**	CO1	Apply DFT for the analysis of digital signals & systems	
	CO2	Design IIR filters and understand its characteristics.	
	CO3	Design FIR filters and understand its characteristics.	
	CO4	Characterize the effects of finite precision representation on digital filters	
	CO5	Understand the architecture of Digital Signal Processor and its applications.	
EC8552 **Computer** **Architecture and** **Organization**	CO1	Elaborate the basic structure of computer system and different instruction format in MPS architecture.	
	CO2	Illustrate the fixed point and floating-point arithmetic for ALU operation.	
	CO3	Understand the implementation schemes of control unit and pipeline performance	
	CO4	Explain the concept of various memories, interfacing and organization of multiple processors.	
	CO5	Describe parallel processing technique and unconventional architectures	
EC8551 **Communication** **Networks**	CO1	Understand the division of network functionalities into layers.	
	CO2	Identify the components required to build different types of networks	
	CO3	Understand the concept of various protocols in routing and multicasting.	
	CO4	Apply flow control and congestion control algorithms for data transmission	
	CO5	Examine the various operations of application layer protocols such as WWW, HTTP and DNS.	
CS8392 **Object Oriented** **Programming**	CO1	Develop Java programs using OOP principles.	
	CO2	Develop Java programs with the concepts inheritance and interfaces.	
	CO3	Build Java applications using exceptions and I/O streams.	
	CO4	Develop Java applications with threads and generics classes.	
	CO5	Develop interactive Java programs using swings.	
EC8073 **Medical Electronics**	CO1	Understand the various physiological parameters, recording methods and also the method of transmitting the parameters.	
	CO2	Comprehend the non-electrical physiological parameters and their measurement – body temperature, blood pressure, pulse, blood cell count, blood flow meter etc	
	CO3	Interpret the various assist devices used in the hospitals viz. pacemakers, defibrillators, dialyzers and ventilators	
	CO4	Comprehend physical medicine methods eg. ultrasonic, shortwave, microwave	

		surgical diathermies , and bio-telemetry principles and methods
	CO5	Know about recent trends in medical instrumentation
OIT552 Cloud Computing	CO1	Articulate the main concepts, key technologies, strengths and limitations of cloud computing.
	CO2	Learn the key and enabling technologies that help in the development of cloud.
	CO3	Develop the ability to understand and use the architecture of compute and storage cloud, service and delivery models.
	CO4	Explain the core issues of cloud computing such as resource management and security.
	CO5	Choose the appropriate technologies, algorithms and approaches for implementation and use of cloud.
OMD552 Hospital Waste Management	CO1	Know about the healthcare hazard control and accidents.
	CO2	Understand biomedical waste management
	CO3	Describe the various Hazardous Materials
	CO4	Learn the various facility guidelines and its safety methods.
	CO5	Understand about infection control and patient safety.
EC8562 Digital Signal Processing Laboratory	CO1	Generate elementary digital time sequence using MATLAB and DSP Processor.
	CO2	Generate linear and circular convolution using MATLAB.
	CO3	Implementation of Correlation techniques and DFT Frequency analysis in MATLAB.
	CO4	Design of FIR and IIR Filters in MATLAB and DSP Processor
	CO5	Analyze the architecture of a DSP Processor and to implement Up-sampling and Down sampling Operation in DSP Processor
EC8561 Communication Systems Laboratory	CO1	Simulate & validate the various functional modules of Communication system.
	CO2	Design AM, FM & Digital Modulators for specific applications. Demonstrate their knowledge in base band signaling schemes through implementation of FSK, PSK and DPSK
	CO3	Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of communication system
	CO4	Implement Equalization algorithms and Error control coding schemes
	CO5	Simulate & validate various functional modules and end-to-end Link of a communication system
EC8563 Communication Networks Laboratory	CO1	Communicate between two desktop computers.
	CO2	Implement the different protocols
	CO3	Program using sockets.
	CO4	Implement and compare the various routing algorithms.
	CO5	Use the simulation tool.

VI Semester		
EC8691 **Microprocessors and** **Microcontrollers**	CO1	Elaborate on the architecture of 8086 microprocessor and develop assembly language programs.
	CO2	Learn 8086 system Bus structure to design multiprocessor systems
	CO3	Apply the concepts of Peripherals and implement memory and I/O Interfacing circuits.
	CO4	Elaborate on the architecture of 8051 microcontroller and develop assembly language programs.
	CO5	Design and implement 8051 microcontroller based systems
EC8095 **VLSI Design**	CO1	Realize the concepts of digital building blocks using MOS transistor
	CO2	Design combinational MOS circuits and power strategies.
	CO3	Design and construct Sequential Circuits and Timing systems.
	CO4	Design arithmetic building blocks and memory subsystems
	CO5	Apply and implement FPGA design flow and testing.
EC8652 **Wireless** **Communication**	CO1	To understand about the characteristics of wireless channels.
	CO2	Evolve the system design specifications of wireless channels.
	CO3	Design a cellular system based on resource availability and traffic demands
	CO4	Identify suitable signaling and multipath mitigation techniques for the wireless channel and system under consideration.
	CO5	To understand the concepts of multiple antenna techniques.
MG8591 **Principles of** **Management**	CO1	Understand and discuss the concept of management and organizations.
	CO2	Compare and contrast the roles of a manager as decision maker, planner, and strategist.
	CO3	Describe organizational structure, Centralization and Decentralization and Career management
	CO4	Apply motivational techniques and theories of leadership and communication process
	CO5	Choose appropriate budgetary techniques and role of IT in management
EC8651 **Transmission Lines and** **RF Systems**	CO1	Discuss the propagation of signals through transmission lines.
	CO2	Analyze the transmission lines at high frequencies
	CO3	Provide solutions to high frequency lines.
	CO4	Design passive filters for transmission lines.
	CO5	Explain radio propagation in guided systems
EC8004 **Wireless Networks**	CO1	To understand the concept about Wireless networks, protocol stack and standards
	CO2	Analyze the network layer solutions for Wireless networks
	CO3	Fundamentals of 3G Services, its protocols and applications
	CO4	Gain knowledge on internetworking of WLAN and WWAN

	CO5	Implement different type of applications for smart phones and mobile devices with 4G network strategies.
EC8681 Microprocessors and Microcontrollers Laboratory	CO1	Develop 8086 ALP Programs for fixed and Floating Point and Arithmetic.
	CO2	Interface different I/Os with processor.
	CO3	Generate waveforms using Microprocessors.
	CO4	Develop ALP programs using 8051 kits and MASM.
	CO5	Explain the difference between simulator and Emulator.
EC8661 VLSI Design Laboratory	CO1	Develop HDL code for basic as well as advanced digital integrated circuits.
	CO2	Apply the fundamental principles of VLSI circuit design in digital and analog domain
	CO3	Import the logic modules into FPGA Boards.
	CO4	Design, Simulate and Extract the layouts of Analog and Digital IC Blocks using EDA tools
	CO5	Synthesize Place and Route the digital IPs.
HS8581 Professional Communication	CO1	Make effective presentations
	CO2	Participate confidently in Group Discussions.
	CO3	Attend job interviews and be successful in them.
	CO4	Develop adequate Soft Skills required for the workplace.
	CO5	Understand about Career management.

VII Semester		
EC8701 **Antennas and** **Microwave Engineering**	CO1	To understand the basic principles in antenna and microwave system design
	CO2	Design and assess the performance of various antennas
	CO3	Demonstrate the need for antenna arrays and design antenna arrays for diverse applications.
	CO4	Describe the passive and active microwave devices.
	CO5	Design of a microwave system for the given application specifications
EC8751 **Optical Communication**	CO1	Realize basic elements in optical fibers, different modes and configurations.
	CO2	Analyze the transmission characteristics associated with dispersion and polarization techniques.
	CO3	Design optical sources and detectors with their use in optical communication system
	CO4	Demonstrate the functioning of optical receivers and evaluate the performance of optical fibers using various measuring techniques.
	CO5	Design optical communication systems and its networks.
EC8791 **Embedded and Real** **Time Systems**	CO1	Describe the architecture and programming of ARM processor
	CO2	Apply system design techniques to develop software for embedded systems
	CO3	Explain the basic concepts of real time Operating system design.
	CO4	Explain system design techniques and networks for embedded systems
	CO5	Model real-time applications using embedded-system concepts
EC8702 **Ad Hoc and Wireless** **Sensor Networks**	CO1	Describe the basics of Adhoc wireless Network and its routing protocol.
	CO2	Understand the wireless sensor architecture and its applications.
	CO3	To identify appropriate physical and MAC layer protocols
	CO4	Understand the transport layer and security issues possible in Ad hoc and sensor networks
	CO5	Build simple modules and be familiar with the OS used in wireless sensor networks.
GE8071 **Disaster Management**	CO1	To understand the relationship between vulnerability, disasters, disaster prevention and risk reduction
	CO2	Assess vulnerability and various methods of risk reduction measures as well as mitigation.
	CO3	To understand inter relation between disaster and development projects.
	CO4	Draw the hazard and vulnerability profile of India, Scenarios in the Indian context.
	CO5	Acquire the basic skills necessary for appropriately reacting to possible disasters in the locations where they reside.
OBM752 **Hospital Management**	CO1	Explain the principles of Hospital administration.
	CO2	Identify the importance of Human resource management.
	CO3	List various marketing research techniques.

	CO4	Identify Information management systems and its uses
	CO5	Understand safety procedures followed in hospitals
OCY751 **Waste Water Treatment**	CO1	Understand about the requirements of water, its preliminary treatment.
	CO2	Different methods of Industrial water treatments.
	CO3	Gain idea about various conventional methods available for water treatment
	CO4	Describe about pre and primary treatments of waste water and its methodologies.
	CO5	Knowledge about adsorption and oxidation process.
EC8711 **Embedded Laboratory**	CO1	Write programs in ARM for a specific Application.
	CO2	Interface memory, A/D and D/A convertors with ARM system
	CO3	Analyze the performance of interrupt
	CO4	Write program for interfacing keyboard, display, motor and sensor.
	CO5	Implement zigbee protocol with ARM systems.
EC8761 **Advanced Communication Laboratory**	CO1	Analyze the performance of simple optical link by measurement of losses and Analyzing the mode characteristics of fiber
	CO2	Analyze the mode characteristics, eye Pattern, Pulse broadening of optical fiber and the impact on BER.
	CO3	Estimate the Wireless Channel Characteristics and Analyze the performance of Wireless Communication System
	CO4	Understand the intricacies in Microwave System design
	CO5	Characterize Directional Couplers, Isolators, Circulators, Gunn diode and microwave IC filters.

VIII Semester		
EC8094 **Satellite Communication**	CO1	Discuss and analyze the fundamentals of satellite orbits.
	CO2	Analyze space segment and link budget.
	CO3	Analyze the earth segment.
	CO4	Discuss various satellite accessing techniques.
	CO5	Design various satellite applications.
GE8076 **Professional Ethics in Engineering**	CO1	Apply morals and human values in work for professional excellence.
	CO2	Apply ethical theories in engineering.
	CO3	Develop as responsible Experimenters with codes of ethics.
	CO4	Discuss the ethical issues related to engineering and realize the responsibilities and rights in the society.
	CO5	Elaborate on global issues with ethical attitude.
EC8811 **Project Work**	CO1	On Completion of the project work students will be in a position to take up any challenging practical problems and find solution by formulating proper methodology.