DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
Program & course outcomes Detail

Sr. No.	Academic contents	Types of contents	Outcomes
1.	**Programme**	**B.Tech.**	1. An ability to apply knowledge of mathematics, science and engineering in practice 2. An ability to identify, critically analyze, formulate and solve engineering problems 3. An ability to select appropriate engineering tools and techniques and use them with dexterity 4. An ability to design a system and process to meet desired needs within realistic constraints such as health, safety, security and manufacturability 5. An ability to devise and conduct experiments, interpret data and provide well informed conclusions 6. An ability to understand the impact of engineering solutions within purview of laws, in a contemporary, global, economical, environmental, and societal context for sustainable development 7. An ability to function professionally with ethical response ability as an individual as well as in multidisciplinary teams with positive attitude 8. An ability to communicate effectively 9. An ability to appreciate the importance of goal setting and to recognize the need for life-long learning. 10. To produce well informed socially responsible global citizen with sharp critical thinking skills having sound awareness about finance management, engineering laws and human rights, ethics and values. They will have entrepreneurial spirit.

Sr. No.	Academic contents	Types of contents	Outcomes
2.	Specific Programme	B.Tech (ECE)	1. **Scholarship of Knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems. 2. **Critical Thinking**: Shoulder responsibilities in planning and utilization analyzing the processes critically.

			3. **Problem Solving**: Design Electronics and communication systems to meet specific social needs and problems.
			4. **Research Skill**: Analyze and model the Electronics systems and hence effectively contribute towards research and complex problem.
			5. **Usage of Modern Tools**: Cope up with the state-of-art (Modern Tool) in Electronics Engineering in tune with modern engineering tools.
			6. **Collaborative and Multi disciplinary work**: Contribute in academics by way of multidisciplinary works involving social health, safety, legal, and consequent responsibility.
			7. **Environment and Sustainability**: Appreciate the impact of industrial activities on global warming and finding the sustainable technical solutions through independent and reflective learning.
			8. **Ethics**: Understand the importance of financial aspects in system infrastructure development with ethical principles and social responsibilities.
			9. **Individual and Team Work**: Undertake project in emerging areas to function effectively as an individual, and as a member or leader in diverse teams.
			10. **Communication**: Communicate effectively with diverse audiences and able to write/present effective reports and design technical documentation.
			11. **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.

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3.	**Course**	**Optical Communication (8th Semester)**	1. Analyze different component of optical fiber' 2. Analyze different optical sources and detectors
		VLSI Design (8th Semester)	1. students able to design various building blocks used in various integrated circuits Beside these the student will be also be able to design low power digital cells to meet the requirement of low power dissipation
		Soft Computing (8th Semester)	1. Identify to learn from the data 2. Identify and solve the classification problem 3. Identify Soft computing for better classification

		Digital Image Processing (8th Semester)	1. Process the images using different image processing tools 2. Learn to highlight images by image enhancement techniques 3. Remove noises using restoration methods 4. Segment images for classification
		Modelling & Simulation (Int) (8th Semester)	1. Modelling skill of transport systems and processes. Knowledge about prediction of traffic. 2. Analysis skill of transport processes.
		Advanced Digital Signal Processing (Int) (8th Semester)	1. Learn to estimate the parameters 2. Learn to minimize the error 3. Able to design adaptive filters
		Antenna & Wave Propagation (6th Semester)	1. Understand the concept of how does antenna radiates and receives. 2. Understand the concept of wave propagation. 3. Understand various type of antenna arrays. 4. Understand the working of various type of antenna 5. Able to design antennas.
		Data Communication (6th Semester)	1. Understand the fundamental concepts in computer communications 2. Understand how data communications over a data link to transfer of information across local-area networks and wide-area networks.
		Cellular Mobile Communication (6th Semester)	1. Understand the basic concepts of wireless communications and media access layers of network protocol stack. 2. Understand the concepts related to systems include cellular networks (GSM), wireless LANs (IEEE 802.11) and ad hoc wireless and personal area networks (e.g., Bluetooth, ZigBee).
		Microcontroller & Embedded Systems (6th Semester)	1. Able to design a system using microcontrollers 2. Able to learn programming. 3. Able to interface using microcontroller
		VlSI Tech (6th Semester)	1. Explain The Fabrication Steps of any Semiconductor Devices

			2. Explain Different Processes Such As Oxidation, Photolithography, Wet Etching, Metal Deposition, Ion Implantation, Annealing
		Digital System Design (4th Semester)	1. Able to implement a digital system. 2. Able to handle the challenging problems while designing
		Computer System Organization (4th Semester)	It will cover machine level representation of data, instruction sets, computer arithmetic, CPU structure and functions, memory system organization and architecture, system input/output, multiprocessors, and digital logic.
		Signal & System (4th Semester)	1. Understand the basic concepts of signals and systems 2. Identify the signals 3. Able to convert the signals from time domain to frequency domain using z transform, Laplace transform, Fourier Transform.
		Electronics Circuit & Linear Integrated Circuits (4th Semester)	1. Infer the DC and AC characteristics of operational amplifiers and its effect on output and their compensation techniques. 2. Elucidate and design the linear and non-linear applications of an OP-AMP and special application ICs. 3. Explain and compare the working of multi-vibrators using special application IC 555 and general-purpose OP-AMP. 4. Classify and comprehend the working principle of data converters. 5. Illustrate the function of application specific ICs such as Voltage regulators, 6. PLL and its application in communication.
		Analog Communication (4th Semester)	a) Able to design Amplitude modulation and demodulation systems. b) Able to implement Angle modulation and demodulation systems. c) Understand the noise performance of various receivers. d) Understand the concepts of channel coding.

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3.		**Wireless Ad-hoc Networks** (7th Semester)	1. Ability to acquire the basic knowledge of various aspects of wireless ad-hoc networks, from design through performance issues to application requirements. 2. Ability to prepare students to perform and analysis the characteristics features of networks and applications of wireless ad-hoc networks after completion of the classes.
		Nano electronics (7th Semester)	As Microelectronics Reaches Up To Its Limit In Miniaturization Now Nano electronics Is Emerging As Future Electronics With This Syllabus Student Dents Shall Able To Understand 1. Basic Principle Of Nanoelectronics 2. Synthesis Of Nano Structure & Nano Devices 3. Characterization Method For Nano Structures 4. Working Of Nano Devices
		Introduction to Internet of Things IoT (7th Semester)	1. Fundamentals of IoT. 2. Application Areas of IoT. 3. Ability to program IoT devices.
		Microwave Engineering (7th Semester)	1. Analyze different microwave devices, networks and components 2. 2. Analyze and measure different microwave parameters like VSWR impedance power wavelength etc
		Satellite Communication (7th Semester)	1. Understand the fundamental principal of Satellite Communication 2. Understand useful satellite orbits for satellite communication tasks 3. Describe the various types of antenna used in satellite communication 4. Calculate complete Link budgets. 5. Calculate signal to noise ratio in satellite communication

		Advanced Microprocessor & Interfacing (5th Semester)	1. Understand the basic concepts of programming using microprocessors 2. Able to program 3. Able to do interfacing using microprocessors
		Control Systems (5th Semester)	1. Able to implement open loop and closed loop system 2. Analysis of time domain and frequency domain techniques
		Digital Signal Processing (5th Semester)	1. Able to implement a FIR and IIR systems 2. Able to design a filter 3. Able to reduce computations using FFT algorithms
		Electromagnetic Theory (5th Semester)	a. Able to evaluate static magnetic fields b. Able to understand how materials affect electric and magnetic fields c. Able to understand principles of propagation of uniform plane waves.
		Digital Communication (5th Semester)	a. The student will know the constituents of a digital communications system. b. The student will know the different modulation techniques in digital communications system. c. The student will understand basic information theory d. The student will learn source coding techniques. e. The student will understand basic Error Control Coding
		Digital Electronics (3th Semester)	1. Ability to acquire the basic knowledge of digital logic levels and application of knowledge to understand digital electronics circuits. 2. Ability to prepare students to perform the analysis and design of various combinational and sequential circuits and visualize the working /operation of circuit / device / equipment / technique after completion of the classes.
		Network Analysis and Synthesis (3th Semester)	1. Able to solve problems using KCL and KVL 2. Able to differentiate mesh and nodal analysis 3. Understanding and solving problems using different Network Theorems 4. Implementation of two port network 5. Analysis and synthesis of Networks

		Architecting Smart IoT Devices (3th Semester)	1. Comprehend and analyze IoT architecture reference model. 2. Comprehend the characteristics of various IoT Communication Architecture, topologies and Hierarchy. 3. Comprehend the concepts of ETSI IoT architecture standards for different use cases under discussion. 4. Architect an IoT system for real life applications. 5. Having an ability to design a component or a product applying all the relevant standards and with realistic constraints.
		Semiconductor Devices (3th Semester)	1. Understand the concept of various semiconductor devices. 2. Design and analyse various electronic circuits. 3. Understand the concept of BJT and MOSET. 4. Analyse and design feedback amplifiers. 5. Design various type of oscillators.
		Advanced Logic Design (9th Semester)	1. Implementation of digital systems using VHDL And Virology 2. Synthesis of digital circuits using Xilinx
		Wireless Ad-hoc Networks (9th Semester)	1. Ability to acquire the basic knowledge of various aspects of wireless ad-hoc networks, from design through performance issues to application requirements. 2. Ability to prepare students to perform and analysis the characteristics features of networks and applications of wireless ad-hoc networks after completion of the classes.
		Mixed Analog Digital Design (9th Semester)	Understanding of the issues in mixed signal VLSI design. 1. Understanding of the Mixed Signal Layout issues. 2. 2. Understanding of the various circuits like Current mirrors, Source follower, Cascode Stage etc. 3. Understanding of the feedback amplifiers. 4. Ability to design the CMOS differential amplifiers, operational amplifiers etc. 5. Understanding of the non-linear & dynamic analog circuits.

			6. Understanding of the data converter fundamentals, data convertor architectures:
		Advanced Digital Communication (9th Semester)	a) Understanding of digital modulation techniques used in wireless communication. b) Understanding equalization techniques and diversity concepts.

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		M.Tech1st Semester Communication System	
		Quantitative Techniques (M.Tech 1st Semester)	a) A course which summarizes and consolidates previously covered material in Marketing, Computer Information Systems and Quantitative Methods. It introduces students to (1) the quantitative and qualitative analysis of large bodies of marketing data and (2) to the manipulation of this data to achieve desired objectives.
		Advanced Digital Communication (M. Tech 1st Semester)	b) Understanding of digital modulation techniques used in wireless communication. c) Understanding equalization techniques and diversity concepts.
		Wireless ad-hoc Networks (M. Tech 1st Semester)	1. Ability to acquire the basic knowledge of various aspects of wireless ad-hoc networks, from design through performance issues to application requirements. 2. Ability to prepare students to perform and analysis the characteristics features of networks and applications of wireless ad-hoc networks after completion of the classes.
		Advanced Digital Signal Processing (M. Tech 1st Semester)	1. Learn to estimate the parameters 2. Learn to minimize the error 3. Able to design adaptive filters.
		Mobile & Satellite Communication	1. Understand the principles, concepts and operation of satellite communication systems

		(M. Tech 1st Semester)	2. Describe concept of geostationary satellite and its various applications. 3. Understand the various concepts of earth station. 4. Design and analyze satellite link.
		M.Tech3rd Semester	
		Mixed Analog Digital Design M. Tech 3rd Semester	Understanding of the issues in mixed signal VLSI design. 1. Understanding of the Mixed Signal Layout issues. 2. Understanding of the various circuits like Current mirrors, Source follower, Cascode Stage etc. 3. Understanding of the feedback amplifiers. 4. Ability to design the CMOS differential amplifiers, operational amplifiers etc. 5. Understanding of the non-linear & dynamic analog circuits. 6. Understanding of the data converter fundamentals, data convertor architectures:
		System On Chip M. Tech 3rd Semester	The objective of this course is to provide students with a sound knowledge of VLSI systems covering the following: 1. Processor architectures, memory organization and performance analysis, and concepts and techniques for parallel processing and pipeline processing. 2. High-speed synchronization design and system noise consideration. 3. VLSI system design verification and testability, and system reliability.